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TROPICAL DISEASES BULLETIN

Vol. 4. 1914. No. 3.

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BUREAU.

General Editor:
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COMMONWEALTH MYCOLOGICAL INSTITUTE 26 MAY 1971

London:
TROPICAL DISEASES BUREAU,
Imperial Institute, S.W.

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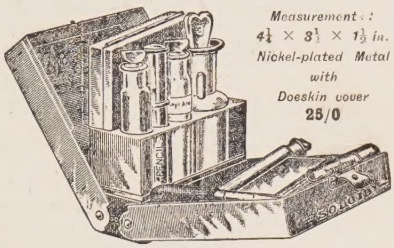

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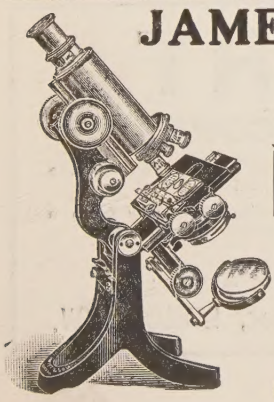

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TROPICAL DISEASES BULLETIN.

Vol. 4.] 1914. [No. 3.

TUBERCULOSIS IN NATIVE RACES.

CHANDRA SEKHAR (P. S.). **Prevention of Tuberculosis in Madras.**—*Proc. Second All-India Sanitary Conference held at Madras, Nov. 11th to 16th, 1912.* Vol. 3. Research. pp. 284-293. (1913. Simla: Govt. Central Branch Press).

This very disquieting paper brings forward considerable grounds for the belief that tuberculosis is not only very prevalent but increasing amongst the native population of India. The absence of reliable registration of deaths or any adequate vital statistics, except in the large towns, makes it almost impossible to assess the degree of prevalence of the disease, but the Annual Reports of the Surgeon-General, Madras, founded on the number of persons attending Hospitals only, show that the numbers diagnosed as tubercular have nearly doubled during the last ten years. Examination of the relatives of those coming for treatment leads Dr. Chandra Sekhar to the conclusion that for every consumptive diagnosed, there are at least two cases in the house in an earlier stage of the disease. Bovine infection can be practically ignored in a country where neither milk nor meat of cows is used raw, and it is certain that man is here the chief source of danger to man. Preventive measures are recommended as follows :—

(1) Improvement of general sanitation.
(2) Grouping of villages into ' village unions ' for purposes of sanitation and statistics.
(3) Improved building regulations in towns as well as in villages.
(4) Education of the public in matters pertaining to health.
(5) Early diagnosis and treatment of incipient cases of tuberculosis.
(6) Prohibition of indiscriminate spitting.
(7) Notification of infectious (open) cases.
(8) Provision of consumption hospitals and sanatoria.

The question of tuberculosis in India is of incalculable importance and has not received anything like adequate consideration. As Dr. Sekhar says, " for a long time medical men in this country have been unwilling to recognise the prevalence of typhoid fever and tuberculosis amongst the native population of India. But during the last twenty years medical men have been gradually convinced of the existence of both these diseases amongst the Indians." It is at least probable that tuberculosis would have been recognised as common, if it had been

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widely spread twenty years ago. The mere fact of medical examination of recruits for the Indian Army would have led to recognition of its prevalence. The average percentage of bodies presenting tubercular lesions post mortem in Madras General Hospital for 5 years is 13·56, a figure very much lower than that for Europeans as recorded by Nageli and by Burghart. There is much reason to think that the facilities of communication and the increase of urban populations, as well, perhaps, as the increased aggregation of children and youths in schools and colleges, have led to a recent and considerable spread of the disease amongst a population hitherto not very widely infected. If this is so, the manner of life of the poorer classes in India is such as to favour a still greater increase in the mortality from tuberculosis in the future. Much light would probably be thrown on the problem by ascertaining the percentage of positive v. Pirquet tuberculin reactions amongst clinically healthy persons in urban and rural areas. It is safe to assert that in a population hitherto comparatively free from tuberculosis and now exposed to infection under tropical conditions of life all the measures found necessary in Europe will be more necessary still. The recommendations of Dr. Chandra Sekhar should receive the gravest consideration.

S. Lyle Cummins.

Fox (C. J.). **Tuberculosis and its Relation to Public Health.**—*Proc. Second All-India Sanitary Conference held at Madras, Nov. 11th to 16th, 1912.* Vol. 3. Research. pp, 294-298. (1913. Simla: Govt. Central Branch Press).

Lieutenant Fox advocates notification of tuberculosis, the formation of anti-tuberculosis societies by the public, and adequate sanatorium accommodation for suitable cases, together with the establishment of tuberculin dispensaries in every town. Incidentally his description of the ideal Sanatorium for India throws a side light on the difficulties to be anticipated in applying such methods in the East. The purdah system has to be taken into account and, in preparing sanatorium accommodation for women, it will be necessary to provide room for female relations or companions, without whom it would be impossible for the patient to remain in the Institution, and a female staff of doctors and attendants.

[The recommendations, though sound in themselves, hardly allow sufficiently for the local difficulties.]

S. L. C.

Sitsen (A. E.). **Enkele aantekeningen over het voorkomen van Tuberculose onder Inlanders in Batavia.** [Some Observations on the Occurrence of Tuberculosis amongst Natives in Batavia.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1914. Vol. 54. No. 1. pp. 47-65.

From a statistical enquiry compiled by the author from public records, tuberculosis would appear to be not uncommon amongst the native population of Batavia, Java. Its occurrence, however, seems to be generally overlooked from the comparative rarity of pulmonary phthisis. Out of 14 post mortem examinations made by the author on

patients in whom tuberculosis in some form or another was the cause of death, pulmonary phthisis was the immediate cause in only one-half, pleurisy and peritonitis furnishing the remainder. Out of a large number of post mortems on subjects dying from other causes, however, obsolete foci of tuberculosis in the lungs were found in about 50 per cent., showing that infection is common enough.

J. B. Nias.

HEINEMANN (H.). **Tuberkulose - Beobachtungen an javanischen Kontraktarbeitern.** [Tuberculosis among Javanese Contract Labourers.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1914. Vol. 54. No. 2. pp. 206-211.

The author finds in the paper by A. E. SITSEN (see above) an interesting contrast to and completion of his own and BAERMANN'S observations on Javanese contract labourers in the plantations of Sumatra. SITSEN has shown that tuberculosis is very prevalent amongst the native-born inhabitants of Batavia, the bodies of persons dying from diseases other than tuberculosis showing old tubercular lesions in about half the cases post mortem. It would appear, then, that the disease has gained a firm footing in Batavia, as in many other tropical towns, while its course seems to tend to be of a rather chronic and benign type, as evidenced by the finding of healed apical lesions in clinically non-tubercular persons. All this is in marked contrast to the findings of the author and BAERMANN in Javanese labourers recruited almost entirely in the country districts. In 284 post mortems on clinically non-tubercular persons, only 4, or 1·4 per cent, showed old tubercular lesions. In 3,580 labourers submitted to the von Pirquet test, only 125, or 3·5 per cent. were found to give a positive reaction. The tubercle death rate from 17,000 men came to 3·47 per mille. These differences are not to be explained by saying that the labourers are specially selected men, because no care in selection can eliminate men with clinically undiagnoseable chronic apical lesions. It would seem to be a case of the phenomenon noted by DEYCKE in Turkey, "Widespread infection in the centres of civilisation (the towns) and but slight infection of the country districts."

With this low incidence amongst Javanese contract labourers goes a very marked susceptibility to tuberculosis, and a very high case mortality. From July 1st, 1912 to June 30th, 1913, Heinemann and BAERMANN treated 94 cases of tuberculosis from amongst the Plantation labourers. Of these, 59 died of the disease during the year, 10 more died, but as the result of intercurrent diseases, such as dysentery and ankylostomiasis, while 15 were sent back to their homes at their own request, still suffering from the disease and with a very bad prognosis. Of the 94 cases, only 9, and those with 'closed tubercle,' recovered so far as to be able to resume work. In this comparison of his own observations on the incidence of tuberculosis in the agricultural population of Java with those of SITSEN on the urban population of Batavia, Heinemann finds confirmation of the dictum of ROEMER that "the more widespread tubercular disease, the lower will be the case mortality from this cause." Probably as a result of the prevalence of the disease in Batavia, the incidence is beginning to increase in the country districts also and the tubercle death-rate has risen from

0·17 per cent. in 1907 to 0·6 per cent in 1913. To combat this spread of the disease, Heinemann advocates the erection of tuberculosis sanatoria and tuberculin dispensaries, and ultimately the provision of Homes for the incurable cases.

[To judge by recent papers on the subject, a similar contrast between the incidence of tuberculosis in oriental towns and in country districts, with a similar inverse ratio of susceptibility to incidence, is to be found in India, where a closer study of the distribution of tuberculosis by means of modern methods, such as the von Pirquet test, is greatly to be desired.] S. L. C.

LÉGER. **Recherches au Laboratoire de Bamako (Soudan français), sur l'Index paludéen, l'Index filarien, la Tuberculose et la Trypanosomiase humaine.**—*Ann. d'Hyg. et Méd. Colon.* 1914. Jan.-Feb.-Mar. Vol. 17. No. 1. pp. 77-81.

The application of the tuberculin cuti-reaction to 485 natives gave the following results :—

Age.		Number of Persons tested.	Reaction positive.	Per cent.
Children	From 0 to 1 year ..	64	0	0·00
	From 1 to 15 years ..	258	31	12·00
Adults	Men	76	6	7·89
	Women	87	23	27·58

The community at Bamako consists chiefly of the indigenous Bambaras and to a less extent of Moors attracted to the town by opportunities of trade. It is found that the latter are much more heavily infected than the former and Léger regards the Moors as the probable source of the cases occasionally to be found amongst the Bambaras. The danger to the local native is likely to increase in the future and should be provided against while there is yet time. S. L. C.

LOISELET. **La Tuberculose humaine à Madagascar.**—*Rev. de Méd. et d'Hyg. Tropicales.* 1913. Vol. 10. No. 4. pp. 193-201.

The author considers that tubercular infections in Madagascar are caused by a naturally attenuated strain of the tubercle bacillus on the following grounds :—

(1) The stage of cavitation is seldom encountered.

(2) The bacillus displays granular degenerating forms sufficiently characteristic to be distinguished by the trained eye from the European organism.

(3) Inoculation into the guinea-pig, even when intraperitoneal, fails to kill within the usual time, the animal frequently surviving for indefinite periods.

(4) Culture is slow and not profuse.

(5) Tuberculin treatment can be pushed with great rapidity in every

form of the disease, increases by tenths being tolerated without causing reactions. The treatment is, as it happens, successful in the local type of tuberculosis.

The Madagascar bacillus is as benign for the European as for the native, while the latter is severely affected by the European tubercle bacillus. Cases are described supporting the theory that the local strain is of low virulence.

S. L. C.

White (G. Duncan). **Causes of the Prevalence of Pulmonary Tuberculosis in South-East China.**—*China Med. Jl.* 1914. Mar. Vol. 28. No. 2. pp. 71-83.

Although accurate statistics are not available as to the prevalence of tuberculosis in South-east China, certain facts can be adduced to support the very general impression that the disease is wide-spread in the country. In Hong Kong, where deaths are registered, one-ninth of the total death-rate is due to phthisis. The Chinese invariably desire to die at the homes of their ancestors, so there is a constant migration, from Hong Kong to inland villages, of persons suffering from illness likely to prove fatal. The phthisis death-rate recorded is therefore probably very far short of the actual numbers dying of this disease. Amongst the social customs making for the spread of tubercle are (1) the general condition of poverty of the lower classes, leading to underfeeding, etc., (2) the system of early betrothals leading to marriage of infected persons (3) the etiquette that confines young women to the house just when fresh air is so necessary to their health, and (4) overcrowding in badly ventilated rooms and the use of mosquito nets which retain much of the organic impurity added to the air during respiration. Opium, too, plays an important rôle in the propagation of the disease, by the expenditure on it of money required for good food, by its inhibiting action on the digestive functions, by diminishing the phagocytic power of the blood and by leading to the aggregation together of men in ill-ventilated opium-dens.

Cotton clothing, the prevalence of entozoal parasites such as *Ankylostoma duodenale* and *Paragonimus westermani* and the many causes that lower the resistance of persons resident in the tropics, all contribute to favour the spread of tuberculosis in Southern China.

S. L. C.

Krulish (Emil). **Sanitary Conditions in Alaska. A Report upon the Diseases found among the Indians of South-eastern Alaska.**—*U.S. Public Health Rep.* 1914. May 22. Vol. 29. No. 21. pp. 1300-1304. With 8 figs.

The native population of South-eastern Alaska is about 5,200, of whom 2,494 were inspected. Of these, 197 or 7·9 per cent. were detected as suffering from tuberculosis. This included 135 cases of pulmonary disease, 36 osseous and 20 glandular affections, while 4 cases of laryngeal tuberculosis were seen. The author considers that, allowing for the "insanitary conditions which prevail in the majority of native homes harbouring tuberculous cases, the percentage of infection is remarkably low." It is mentioned that, once established, the progress of the disease is rapid, leading to a fatal termination, and that the

pulmonary type is characterised by a marked tendency to profuse haemorrhage. About 50 per cent. of the cases give histories of haemoptysis. An encouraging feature is that the cases respond well to open-air treatment if taken in time.

S. L. C.

MARRABLE (Harold T.). **Tuberculosis in Persia and its Treatment by Koch's Tuberculin.**—*Dublin Jl. Med. Science.* 1914. Jan. 3 ser. No. 505. pp. 1-19.

"Amongst the Persians some fifteen years ago pulmonary tuberculosis was practically unknown except in the coast towns bordering the Caspian on the north and the Persian Gulf on the south where the foreign element enters so largely into the population."

The disease appears to have been introduced by Armenians from India and has spread rapidly within the past five years.

"Until the treatment by tuberculin was commenced," the author had "never come across a case of spontaneous cure" nor seen any other than a fatal termination even when the case was treated as far as possible on Sanatorium lines. Appreciating the fact that this want of resistance to tubercular infection was due to the absence of any such acquired immunity as is possessed by persons brought up under the conditions prevailing in Europe, Dr. Marrable has worked on the lines of making good this deficiency by the use of tuberculin injections commenced as early as possible in the case. The results have been exceedingly favourable. The preparation preferred by the author is P.T.O. (Perlsucht-Tuberculin-Original), a bovine tuberculin supplied in a solution 250 times less concentrated than old tuberculin. He prefers to increase the doses as rapidly as possible, and, where the patient does not seem to be deriving the maximum benefit from the P.T.O., often finds that old tuberculin answers well as an alternative.

S. L. C.

PEIPER (Otto). **Die v. Pirquetsche kutane Tuberkulinreaktion zum Nachweis der Tuberkulose und des Infektionsweges in unseren Kolonien.** [Von Pirquet's Cutaneous Tuberculin Reaction as a means of demonstrating the Presence and Distribution of Tuberculosis in our Colonies.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1914. Feb. Vol. 18. No. 3. pp. 93-97.

ZIEMANN (H.). **Bemerkungen zu der Arbeit von Dr. Peiper "Die v. Pirquetsche kutane Tuberkulinreaktion usw." in Heft 3, 1914, des Archivs.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1914. Feb. Vol. 18. No. 4. pp. 133-136.

PEIPER (Otto). **Entgegnung auf die Bemerkungen von H. Ziemann zu meiner Arbeit "Die v. Pirquetsche kutane Tuberkulinreaktion usw." (Heft 3, 1914 des Archivs) in Heft 4 1914 des Archivs.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1914. Apr. Vol. 18. No. 8. p. 274.

An important paper by H. Ziemann in the *Centralblatt für Bakteriologie* for August 4, 1913, (see this *Bulletin*, Vol. 3, p. 232) dealing with tuberculosis in the tropics, has led to a discussion between the author

and Dr. Otto Peiper as to priority in the application of von Pirquet's cutaneous tuberculin reaction in the mapping out of the distribution of tuberculosis amongst primitive tribes. The only question that can be regarded as open to discussion is that of individual priority as between Ziemann and Peiper, since it is beyond dispute that neither of these workers, great as has been the value of their respective contributions to the subject, can claim priority to either Gros or Wagon who had published accounts of the use of tuberculin tests in the tropics in 1908 and 1910 respectively. This is freely acknowledged by both Ziemann and Peiper. The latter, in his note of most recent date, enlarges the scope of his claim and points out that he also had priority of Ziemann in collecting together the literature on tropical tuberculosis, in dealing with the question of animal tuberculosis in the tropics, and in calling attention to the relative susceptibility of primitive peoples to the disease. Considering the dispute, then, as between Ziemann and Pieper only, there can be no doubt that Peiper has the priority of publication, and it is the universal custom to allot priority on this ground. Ziemann admits this and merely points out that he worked at the subject before Peiper, and had arrived at conclusions similar to those of the latter earlier than and quite independently of any other worker, though prevented by various causes from making his conclusions known in the medical press. It happens that this claim of Ziemann's can be substantiated by a reference to a conversation quoted by Wolff–Eisner in his work "The Ophthalmic and Cutaneous Diagnosis of Tuberculosis" (1908: English translation, page 149) which is worth reproducing in full in this connection.

"The negro does not meet with tubercle bacilli in Africa and therefore in his native land he is free from tuberculosis. In other parts of the world, however, he exhibits an extraordinary tendency to contract tuberculosis. Ziemann himself, who is one of the best authorities on Africa, assured me that this was absolutely due to the fact that the negro in Africa does not come in contact with tubercle bacilli. Ziemann has never found tuberculosis in cattle in Africa. He has observed that, as soon as there is a tuberculous European living in Africa, the negroes living in his vicinity very easily take up the tubercle bacilli."

S. L. C.

FILARIASIS.

HUDELLET (G.). **Contribution à la Distribution Géographique de la Filariose en Afrique Occidentale francaise.**—*Ann. d'Hyg. et Méd. Colon.* 1914. Jan.-Feb.-Mar. Vol. 17. No. 1. pp. 115-123.

Of 2,274 soldiers examined, filariae were found in the blood of 792 by night and 264 by day, that is a general percentage of 46·4. The following table shows the number of people examined and infected from the different colonies :—

Colonies.	Examined.	Filariated.	Percentage.
Senegal	343	123	35·8
Guinea	872	392	44·9
Ivory Coast	327	233	71·2
Dahomey	102	43	42·1
Upper Senegal-Niger ..	605	251	41·4
Mauritania	2	0	—
Other Colonies	15	9	—

The species of filaria found are not here mentioned, but in another part of the paper a statement is made that *F. bancrofti* was encountered more frequently than *F. perstans* or *F. loa*. The latter is rare in French West Africa and the infections noted were generally in those who had lived in French Equatorial Africa. Another table gives the names of the towns and centres specially examined in the different colonies.

[Those specially interested in the subject should refer to the original for these tables.]

G. C. Low.

ROUSSEL (L.) & FOURCADE. **Recherche des Microfilaires au 2e Bataillon de Tirailleurs Sénégalais d'Algérie.**—*Rév. Méd. d'Alger.* 1914. May. Vol. 2. pp. 247-251.

The battalion of soldiers on whom the research was made came from Dakar ; they had been recruited from the bend of the Niger and consisted of a variety of races. 752 men, 193 women and 29 children were examined for filariae. Of these 79 men (10·5 per cent.), 24 women (12·4 per cent.) and no children were found to be infected. The following table shows the species of parasite encountered :—

F. bancrofti	33
F. loa	1
F. perstans	61
bancrofti and *perstans*	2
loa and *perstans*	1
Doubtful	5

Reference is made to the papers of CAZANOVE, and MAROTTE and MORVAN. [See this *Bulletin*, Vol. 1, p. 82 and Vol. 2, p. 87.]

The authors state that albuminuria was frequent in the persons harbouring filariae and they also investigated the question of eosinophilia in seventy of the cases.

In faecal examinations (28 cases) the following ova were found :— Trichocephalus 3 ; Taenia [species not stated] 6 ; Ankylostomes 2.

Emetine, enosol and neo-salvarsan were tried for treatment, but, as the authors rightly point out, the physiological variability of embryos in the peripheral blood renders the interpretation of results obtained after giving these drugs doubtful. G. C. L.

Léger. **Recherches au Laboratoire de Bamako (Soudan français) sur l'Index Paludéen, l'Index Filarien, la Tuberculose et la Trypanosomiase Humaine.**—*Ann. d'Hyg. et Méd. Colon.* 1914. Jan.-Feb.-Mar. Vol. 17. No. 1. pp. 77-81.

Filariasis.—Though symptoms of filariasis are very rare amongst the indigenous natives, yet embryonic forms of filariae—*F. loa*, *F. perstans* and *F. bancrofti*—are found in their blood comparatively frequently. Among 353 adult native prisoners examined at Bamako 32 cases of *F. bancrofti* infection were found (12·64 per cent.) and 17 cases of *F. perstans* (6·71 per cent.). Among 327 other natives, of whom the blood was examined during the day, 20 cases showed embryos of *F. loa* (6·10 per cent.) and 53 *F. perstans* (16·20 per cent.) The presence of so many carriers constitutes, according to the author, a danger which should not be neglected in the prophylaxis of filariasis. G. C. L.

Mathis. **Considération sur le Paludisme et la Filariose en Indochine.** [Clinique d'Outre Mer].—*Ann. d'Hyg. et Méd. Colon.* 1914. Jan.-Feb.-Mar. Vol. 17. No. 1. pp. 215-228.

Filariasis.—Filariasis in Indo-China is due to *Filaria bancrofti*, some of the infections being apparently compatible with health and without manifest symptoms or lesions. Where the latter are seen the localisation is usually about the genitals (hydrocele, orchitis, epididymitis, adenolymphocele).

Elephantiasis of the lower limbs is also common and a case of filariasis showing signs resembling beriberi is described. The author's conclusions are as follows :—

(1) The blood of all subjects presenting lymphatic oedema, hydroceles, orchitis and epididymitis of uncertain origin should be examined by night.

(2) A systematic examination of this sort should be pursued in native hospitals, for thus doubtful diagnoses may be cleared up.

(3) It is necessary to examine the blood on more nights than one because a single negative examination is not sufficient to exclude filariasis.

(4) As a prophylactic measure the destruction of mosquitoes should be carried out as far as possible because of their rôle in the propagation of the disease.

G. C. L.

Bahr (P. H.). **An Epidemiological Study of Filariasis in Ceylon.**—*Parasitology.* 1914. June. Vol. 7. No. 2. pp. 128-134. With 1 map.

The conclusions reached at the end of the study were :—

" (1) That of the four or five known species of filaria blood worms, only one of them, viz. *F. bancrofti*, is represented in Ceylon.

" (2) That its periodicity, as in the case with India, the West Indies and many other countries (but not in many of the Pacific Islands), is of a definitely nocturnal character.

" (3) That it is a rare parasite in the north and centre of the island, but a common one on the east and south coasts.

" (4) That in the endemic areas, the topographical distribution is apparently of a most capricious character.

" (5) That, whereas in some of the villages at least 26 per cent. of the adults are infected, in the neighbouring villages the inhabitants are quite free from the parasite and its associated diseases."

[The inequality of the distribution of filariasis has already been noted by Low for the West Indies and by others elsewhere. No explanation is at present forthcoming of the anomaly. As regards Ceylon the intermediate host of the filaria requires working out.]

G. C. L.

Fülleborn (Friedrich). **Zur Technik der Mikrofilarienfärbung.** [The Technique of Microfilarial Staining.]—*Centralbl. f. Bakt.* 1. Abt. Orig. 1914. Apr. 25. Vol. 73. No. 6. pp. 427-444. With 2 plates and 3 text figs.

A paper dealing with the technique of microfilarial staining. The subject is discussed under the following headings :—

(1) Influence of different preparation methods on the length and shape of microfilariae.

(2) The dehaemoglobinising of thick drops of blood with distilled water, physiological salt solution and 60 per cent. alcohol.

(3) The influence of fixation and subsequent treatment in preserving the condition and thickness of the microfilariae.

(4) Fresh or vital staining.

(5) Researches on the constancy of the percentage length of the anatomical fixed points by different preparation methods.

(6) An appendix in which is given a description of the preparation methods quoted in the work.

As regards fixing methods the author mentions the following :—(*a*) five per cent. formalin solution ; (*b*) the usual dehaemoglobinised films stained with haematoxylin either dried or when wet placed direct in alcohol ; (*c*) specimens fixed wet with sublimate solution, hot alcohol or Looss's glycerine clearing method (1/20 glycerine to 60 per cent. alcohol allowed to evaporate and then glycerine gelatine). Looss's hot alcohol method is specially useful for fixing the larva in a stretched out condition.

As regards " vital staining " or, as Fülleborn now terms it, " fresh staining " (Frischfärbung) the methods by azur-eosin, neutral red and methyl green pyronin are given.

The constancy of the percentage length of the anatomical fixed points by different staining methods is shown in a table. The variation is very small, taking the nerve ring for example, only about 1·5 per cent. In the appendix as already mentioned the different methods of preparation are quoted in detail. It is not necessary to refer to all of those, but as the carbol methyl green pyronin staining

is a new one, it may be given here. Dried thick drops of blood are (1) dehaemoglobinised for a short time with physiological salt solution, (2) the specimens are then stained with Pappenheim-Unna's carbol methyl green pyronin mixed with salt for about half an hour or even longer, (3) they are then quickly passed through alcohol, this differentiating and dehydrating the films, (4) after Xylol they are mounted in cedar wood oil or, if permanent preparations are required, in Canada balsam.

Carbol methyl green pyronin can be obtained from Grübler's in Leipzig. The paper is illustrated with micro-photographs and there is also a coloured plate which shows the effects of the different stains.

G. C. L.

Fülleborn (F.). **Ueber die Lage von *Mikrofilaria loa* (*diurna*) im Trockenpräparat.** [On the Position of *Microfilaria loa* (*diurna*) in Dry Preparation.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1914. Apr. Vol. 18. No. 7. pp. 232-234. With 2 plates and 1 text fig.

The author refers to the position taken up by the embryonic forms of *Filaria bancrofti* and *F. loa* in dried preparations. Manson first pointed out this peculiarity and often used it for clinically differentiating the two embryos. Fülleborn [see this *Bulletin*, Vol. 1, p. 87] pointed out that *F. bancrofti* embryos, when dried on a slide in a damp tropical climate, might take up the usual position of *loa* embryos. He now shows in a series of micro-photographs that *loa* embryos may present the rounded convolutions so typically seen in those of *bancrofti*.

Recently in the case of a native of Kamerun, in whose blood embryos of *loa*, *bancrofti* and *perstans* were present, the opportunity of comparing their different positions occurred. Thick specimens were made in the usual manner and stained with haematoxylin. Photographs taken from these show that in many instances reliance on position alone is uncertain, the only method of coming to a correct diagnosis being a comparative study of the different anatomical points present in each of the embryos.

G. C. L.

Johnston (J. E. L.). **Observations on Variations in Form of Microfilariae found in Man.**—*Ann. Trop. Med. & Parasit.* 1914. Apr. 21. Vol. 8. No. 1. pp. 73-80. With 1 plate.

Whilst the author was in Bassa Province, Northern Nigeria he had under his care a N'doma pagan fifty years of age who complained of pain in the back like lumbago. A few weeks later swelling of both feet and legs appeared, with pains from the knees downwards. Ankylostome ova were found in scanty numbers in the stools. An examination of the blood showed embryonic filariae of three definite types. (1) Embryos varying in length from 83 to 170μ without sheaths, actively motile with a tapering posterior extremity ending in a bluntly pointed tail; (2) Embryos of 230 to 251μ resembling the above closely but having a very sharply pointed tail; (3) Embryos about 300μ in length, sheathed, apparently *Filaria loa*.

The author discusses what these are, a plate showing the different characteristics of the embryos being given. The blood was taken during

the day and the material upon which the observations were made was scanty.

[In the author's preliminary remarks on the sheathless filarial embryos which have been found in man, numerous mistakes occur. (1) *Filaria demarquayi* is said to have periodicity, this is not so: (2) *Onchocerca volvulus* is stated not to have been found in the blood. Apparently the author has not seen Fülleborn's, Simon's and Rodenwaldt's recent papers on Filariasis, either in the originals or in the abstracts made in this *Bulletin*. An examination of his (Johnston's) plate shows that the small filaria with the blunt tail is *F. perstans*, long and short varieties of which have been described before, while the other filaria with the sharp tail and no sheath exactly resembles the pictures given by Rodenwaldt, and in its measurements is evidently the same as that described by Fülleborn and Simon, namely *Onchocerca volvulus*. It is also unfortunate that the scheme proposed by Fülleborn as regards measurements of the different anatomical points has not been followed. The descriptions given by the author are exceedingly difficult to follow.]

G. C. L.

Johns (Foster M.) & Querens (Percy L.). **Further Note on the Growth of Filarial Embryos in Vitro.**—*Amer. Jl. Trop. Diseases & Preventive Med.* 1914. Mar. Vol. 1. No. 9. pp. 620-624. With 1 plate.

In a former note one of the authors—Johns in collaboration with Wellman—announced the cultivation of filarial embryos *in vitro*. The present authors now refer to a criticism by Low on this paper [see this *Bulletin* Vol. 1, pp. 420–421], and agree with him that the term "cultivation" is an improper one. They cannot agree however with the observations of Bach as to there being no increase in length in embryos kept *in vitro*. They repeated their previous experiments and obtained the same results in the case of embryos of *Filaria immitis* and also obtained a greater development with a filarial embryo from an endemic infection of cattle, which they believed to be *Setaria labiato-papillosum*. Their results summed up were as follows:—In dextrose defibrinated blood from the dog, prepared and inoculated as previously outlined in detail, at a temperature of 37° C., the embryos of *Filaria immitis* exhibit growth and motility for a period of about fifteen days, when the media and organisms begin to disintegrate. The development is characterised by an increase in size of from 155·6μ by 4·3μ to 264·5μ by 5·7μ with generative changes which according to the authors denote some development.

In similar cultures from the blood of cattle, at a temperature of 37° C., the embryos of *Setaria labiato-papillosum* exhibited growth and motility for a period of 52 days, when degenerative changes began to take place in both media and organisms. The development was characterised by an increase in size and a commencing development of what appeared to be a visible alimentary tract, mouth parts, and terminal spicule. The authors at present are not in a position to interpret what these changes mean.

G. C. L.

Külz (L.). **Beitrag zur Turnusfrage der Mikrofilarien.** [The Periodicity of Microfilariae.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1914. Apr. Vol. 18. No. 7. pp. 248-250.

At the end of 1905 Külz whilst in South Kamerun became infected with *Filaria loa*. After a lengthy stay in home climates he went to New Guinea in August 1913. He thought it would be interesting therefore to see if the periodicity of the embryos changed from what was observed in Kamerun and at home. In both these geographical positions the parasites had a diurnal type, coming into the blood between seven and nine in the morning, reaching their maximum at three in the afternoon, and disappearing again at nine at night. For his observations he took 0·05 cc. blood, two and a half times the amount recommended by Low and Füllebobn, because of the small number of filarial embryos present in his blood. The preparations were dehaemoglobinised in the usual manner and stained with haematoxylin.

Though the periodicity showed some fluctuation and tendency to become variable in New Guinea, yet the type remained diurnal. The number of filariae in the blood in home climates appeared, however, to be less than in the tropics and the author thinks that this was not mere chance. Whilst in New Guinea the number of filariae in the peripheral blood from different parts of the body was estimated—finger, fore-arm, upper-arm, ear, and leg below the knee. No appreciable differences were found in the numbers.

Experiments with light, heat etc., were also carried out, with results as follows :—

(1) Direct sunlight : left fore-arm exposed for ¼ hour to the mid-day sun ; right fore-arm in the shade—no difference.

(2) Cold : hand held for ten minutes in ice water ; reduction of the number of filariae to half of that in undipped hand.

(3) Influence of heat : (*a*) locally by bringing the hand into water of a temperature of 45° C. No change. (*b*) warm bath of 35° C. of ten minutes duration. No change.

(4) Passive hyperaemia of upper-arm : number increased well over one-third in comparison to that of the normal arm.

A table showing the different geographical points where the periodicity was tested is given. G. C. L.

Dutcher (B. H.). **Recovery of Embryo of *Filaria bancrofti* from Blood from the Lung during Daytime.**—*Jl. Trop. Med. & Hyg.* 1914. June 1. Vol. 17. No. 11. p. 163.

A soldier of the Porto Rican Regiment entered hospital February 16th, 1914, suffering from a mild attack of whooping cough. Between 9 a.m. and 10 a.m. on February 20th he coughed up a small quantity of pure blood embedded in mucus. The author examined this and found that filarial embryos were present in it. He believes this is the first time that such parasites have been obtained from the lungs in the living subject.

[There is no proof that the blood did come from the lung and, as there is no record given in the paper of an examination of the peripheral blood at the same time, this must remain uncertain. A night examination of peripheral blood would also have been interesting in demonstrating the heaviness or lightness of the infection.]

G. C. L.

Martinez (I. Gonzalez). **Fatal Attack of Filarial Lymphangitis simulating Bubonic Plague.**—*Jl. Amer. Med. Assoc.* 1914. May 23. Vol. 62. No. 21. pp. 1622-1624.

A child, aged ten, seriously ill was admitted into the Quarantine Hospital at San Juan, Porto Rico on January 28th supposed to be suffering from plague.

The onset of the attack had been associated with rigors, hyperpyrexia, thirst and later vomiting; finally delirium, stupor and profuse diarrhoea set in.

At the examination nothing was found physically, with the exception of two slightly enlarged and very painful glands in the right groin. The urine however contained red blood cells, epithelial cells, hyaline and granular casts, and a trace of albumin. Blood examinations made the same night at 9 p.m. showed numerous filarial embryos. The child died at 3 a.m. next morning.

At the autopsy no evidence of plague was found. The enlarged glands when dissected out were seen to be red and congested and enclosed in a gelatinous substance—the inflammation spreading up under Poupart's ligament along the line of the iliac vessels into the abdominal cavity.

Liver, pancreas and spleen were normal, but the kidneys were congested and enlarged, as were also the mesenteric and retroperitoneal glands.

The author concludes from the clinical signs and post mortem changes that the case was one of pernicious filarial lymphangitis.

G. C. L.

U.S. Public Health Reports. 1914. May 29. Vol. 29. No. 22. p. 1347. **Plague and Filariasis. The Possibility of Mistaking one for the other.**

Creel, representing the Public Health Service in Habana, has called attention to the fact that in localities where filariasis occurs isolated cases of bubonic plague might be mistaken for it. Such a case is mentioned as having occurred in San Juan, Porto Rico in 1912, the diagnosis at first being made as one of filariasis. Cases of filarial lymphangitis on the other hand simulating bubonic plague [see above] have recently been reported by Martinez in the same island.

[In severe cases of filarial lymphangitis the possibility of mistake might certainly occur.]

G. C. L.

Ziemann (H.). **Bemerkungen zu Prof. Külz. Archiv, Bd. 18. Heft 5. S. 164.**—*Archiv. f. Schiffs- u. Trop.-Hyg.* 1914. Apr. Vol. 18. No. 7. pp. 235-236.

Ziemann replies to Külz's remarks on his paper on Tropical Tissue-Inflammations caused by Filarial Infection [see this *Bulletin* Vol. 3, p. 317.] He brings forward no new facts. Those specially interested in the subject should consult his original paper and also his subsequent remarks.

G. C. L.

Werner (H.). **Phenokoll bei Filarienerkrankung und Bilharziosis.** [Phenokol in Filariasis and Bilharziasis.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1914. Apr. Vol. 18. No. 8. pp. 284-285.

Two cases of filarial disease and one of bilharzia were treated with phenokol. A Bantu negro from West Africa, in whose blood embryos of *Filaria perstans*, *loa* and *bancrofti* were present, received 0·2 gram intravenously. The numbers of the three different species of microfilariae circulating in the blood were not influenced by thls injection. No better results were obtained later when another injection of 0·5 gram was given.

In a case of Calabar swelling, without embryonic filariae in the blood, phenokol given internally in a dose of 0·5 gram, three times a day, produced no effect on the clinical symptoms.

In the case of bilharzial disease the drug appeared to have no effect on the production of the eggs of the parasite.

G. C. L.

Elephantiasis.

Royster (Hubert A.). **Elephantiasis and the Kondoleon Operation.**—*Jl. Amer. Med. Assoc.* 1914. May. 30. Vol. 62. No. 22. pp. 1720-1722. With 2 text figs.

The patient, a mulatto, aged 23, was seen by the author in Raleigh, North Carolina, December 1913, suffering from elephantiasis of the right leg. Born in Virginia, he had lived in Florida and South Carolina. The condition commenced in the summer of 1911. After going over carefully all the procedures proposed for the relief of elephantiasis the author decided to adopt Kondoleon's operation [see this *Bulletin* Vol. 1, p. 93]. "For four days previous the man was put to bed; each day the leg and foot were scrubbed in a strong mercuric chlorid solution, bandaged tightly with a Canton-flannel roller and kept elevated on pillows. As a result of this, the leg was reduced in size about two inches. January 3, 1914, the operation was performed as follows: A long incision was made through the skin on each side of the leg, extending from knee to ankle. Wide retraction of the integument was secured by dissecting it back freely from each edge of the incision. Going from above downward, the deep fascia to the width of three fingers was dissected off the muscles and cut away in one piece of the length of the wound. Also, the same area of subcutaneous tissue was removed by splitting it off the skin. The muscles were laid bare and free hemorrhage occurred, requiring many ligatures. The skin was stitched back in position, dressings applied and the leg bandaged without a splint."

"One week later the first dressing revealed primary union, except at the lower third of the incision on the outer side of the leg, where sloughing of the skin edges had occurred."

As an auxiliary treatment thiosinamin (fibrolysin) was given hypodermically every three days. So far sufficient time has not elapsed to predict what the final result will be. A photograph of the leg before and three months after the operation is given.

[The author's comments on the etiology of the case show a complete absence of knowledge of the subject of filariasis. Further, Mata's

statement which is quoted that "Even in these tropical latitudes, where elephantiasis is common (Barbados leg), its association with filariasis is not as frequent as one would suppose" is quite incorrect. There is nothing against this case having been a filarial one].

G. C. L.

Grothusen. **Zur operativen Behandlung der Elephantiasis scroti.** [Operative Treatment of Elephantiasis scroti.]—*Arch. f. Schiffs- u. Trop. Hyg.* 1914. Apr. Vol. 18. No. 7. pp. 250-252.

The author refers to Kuhn and Guehne's method of dealing with the tunica vaginalis in elephantiasis of the scrotum. (*Arch. f. Schiffs- u. Trop.-Hyg.* 1913. Vol. 17. No. 13, p. 457). He suggests some further modifications of this method and thinks that these may be useful as regards the healing of the flaps. Though he admits that the skin may become necrotic, yet he has not seen such a result in many years' experience. G. C. L.

Patterson (James). **Elephantiasis, with a Report of a Case.**—*Jl. Amer. Med. Assoc.* 1914. Mar. 21. Vol. 62. No. 12. p. 916. With 1 text fig.

A case of elephantiasis occurring in a patient who had never been in the Tropics is reported. Such cases are not uncommon, [see this *Bulletin* Vol. 1, pp. 93 and 94]. The statement that the case was harbouring *Filaria bancrofti* is not borne out by the diagrams, the structures depicted there having no resemblance to such a parasite.

G. C. L.

Wills (E. F.). **Lymphangioplasty in Elephantiasis.** [Correspondence.] —*Brit. Med. Jl.* 1914. Mar. 21. p. 652.

The author tried Handley's lymphangioplastic operation upon a case of elephantiasis complicated with severe leg ulcers. Fairly thick Chinese silk was used, the threads being entered just above the ulcers and brought out above the knee; two different routes were employed. The results were most striking, a new growth of epidermis being visible on the ulcers next day and a rapid cure resulted. G. C. L.

Leber (A.) & v. Prowazek (S.). **Zur Kenntnis der Elefantiasis in Samoa.** [Elephantiasis in Samoa.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1914. Vol. 18. No. 11. pp. 386-394. With 3 text figs.

A somewhat long paper on elephantiasis in Samoa. The question of the relationship of "Mumufieber" with elephantiasis is discussed and a case is quoted which would seem to show that such a relationship does exist. The question of the deep muscle abscesses which are so often found in filariasis regions is also gone into in detail.

The authors only saw cases of elephantiasis in the later years of life but they quote Turner as having seen it in a five year old child and a nine year old boy. Uthemann saw a case of elephantiasis of the scrotum in a nineteen year old native of Samoa.

A list of literature for filariasis in Samoa is given. G. C. L.

Bahr (P. H.). **Demonstration on Elephantiasis and Filariasis.**—*Trans. xvii International Congress of Medicine*, London, 1913. Sect. xxi. Trop. Med. & Hyg. Part. 2. pp. 295-296.

A series of remarks explanatory of a microscopical demonstration on elephantiasis and filariasis. The author believes that the adult filaria after its death becomes calcified and continues to act as an irritant, producing fibrosis in and around the lymphatic tissues in which it is lying.

When the adult worms inhabit the glands these become extensively fibrosed and, according to the author, are found much less resistant to septic organisms. This question of glandular fibrosis may explain the frequent absence of microfilaria in the blood in elephantiasis and other filarial diseases in which the adult filaria itself is the primary factor.

G. C. L.

Animal Filariasis.

Yakimoff (W. L.), Schokhor (N. I.), Koselkine (P. M.), Winogradoff (W. W.), & Demidoff (A. P.). **Recherches sur les Maladies Tropicales Humaines et Animales au Turkestan. V. La Microfilariose des Chevaux au Turkestan.**—*Bull. Soc. Path. Exot.* 1914. Mar. Vol. 7. No. 3. pp. 189-192.

Embryonic filariae possessing a sheath, a column of cells and three colourless spots, and measuring 270 to 323μ in length (without the sheath) by 7·10 to 11·3μ in breadth were found in the blood of Turkestan horses. No periodicity was noted. Similar parasites have been observed in the blood of such animals by Balfour in the Sudan, Lingard in India, Martini in Berlin, Mandel and Mazzanti in Germany and by Wirt in Austro-Hungary. [Until the adults of this filaria have been found it is premature to describe it as a new species].

G. C. L.

Delanoë (P.). **Au Sujet de l'Existence chez un Saurien, *Agama colonorum* Dum. et Bibr., d'une Filaire et d'une Microfilaire Sanguines.**—*Bull. Soc. Path Exot.* 1914. Feb. Vol. 7. No. 2. pp. 121-125.—With 26 figs.

The parasites were observed in a "Margouillat," a species of lizard captured at Bouaké on the Ivory Coast. The embryonic forms measured 190μ long by 6μ broad and were enclosed in a sheath. The extremity of the tail was blunt. Eight adult filariae were found at autopsy, all of these being females. They were coiled up in a mass in the liver, but had not produced any apparent signs of degeneration in the organ. They measured 12–13 cm. in length and 0·275 mm. in breadth. They were filiform and of a white colour.

Rodhain in 1906 described in an *Agama colonorum* on the Oubangui embryo filariae. These were also sheathed but differ from Delanoë's in their measurements, only measuring 89μ with the sheath, and 66μ without it. Further, the adults in these cases were found in the subcutaneous tissues between the skin and the muscles.

G. C. L.

Railliet & Henry. *Filaria furcata.* [Correspondence.]—*Bull. Soc. Path. Exot.* 1914. Mar. Vol. 7. No. 3. p. 175.

Railliet and Henry who have examined the adult filariae collected by Suldey from a chameleon in Madagascar [see this *Bulletin* Vol. 3, p. 317] have determined that the parasite is *Filaria furcata* von Linstow, 1899.

The species of chameleon which harboured the filariae has been determined by Roule, Professor of the Museum of Natural History, as *Chamaeleo oustaleti* Mocq.

G. C. L.

Yakimoff (W. L.) & Schokhor (N. I.). **Recherches sur les Maladies Tropicales Humaines et Animales au Turkestan. IV. Les Microfilaires des Animaux Domestiques au Turkestan.**—*Bull. Soc. Path. Exot.* 1914. Mar. Vol. 7. No. 3. pp. 188-189.

A table shows the percentage of domestic animals, infected with filariae, found by the authors in different localities of Turkestan. 22 per cent. of camels, 3·3 per cent. of donkeys, 2 per cent. of mules and 15 per cent. of cattle at one or other locality harboured these parasites. The number of animals examined is not stated.

G. C. L.

Dracontiasis.

Yakimoff (W. L.). **Recherches sur les Maladies Tropicales Humaines et Animales au Turkestan. VI. La Formule Leucocytaire du Sang des Malades renfermant** *Filaria medinensis.*—*Bull. Soc. Path. Exot.* 1914. Mar. Vol. 7. No. 3. p. 192.

A number of bloods of people harbouring *Filaria medinensis* at Bokhara were examined; the following table gives the results of a series of differential leucocyte counts:—

	1.	2.	3.	4.	5.	6.
Polymorphonuclears ..	35·0	51·6	60·7	54·9	47·6	33·0
Large mononuclears ..	5·1	—	3·5	—	6·1	3·3
Lymphocytes	45·4	36·0	29·7	31·0	33·6	42·9
Eosinophiles	9·9	17·2	2·4	12·0	5·4	14·6
Transitionals	2·5	3·2	3·5	0·5	0·3	6·1
Mast cells	—	—	—	0·5	0·3	—
Myelocytes	1·9	—	—	0·5	6·4	—

[The relative increase of the eosinophiles is well shown in the above table. The percentages however are not correct, the total figures being above or falling short of a hundred.]

G. C. L.

HEAT STROKE.

PEMBREY (M. S.). **Heat-Stroke. Further Observations on an Analysis of Fifty Cases.**—*Jl. R. Army Med. Corps.* 1914. June. Vol. 22. No. 6. pp. 629–638.

This paper is a continuation of Dr. Pembrey's analysis of 50 cases (see this *Bulletin*, Vol. 2, p. 647). The author invites attention to the divergence of opinion still existing in the services as to the identity or otherwise of heat-stroke and sun-stroke, contrasting the statement of Leonard ROGERS that two separate conditions exist, the one syncopal and caused by the direct rays of the sun, the other hyperpyrexial, following high atmospheric temperature, with the opinion of Colonel SIMPSON, A.M.S., and Major W. H. OGILVIE, I.M.S., that there is no essential difference between the two conditions. Pembrey himself concludes that the actinic rays of the sun are only an indirect factor in the causation of heat-stroke, inasmuch as they necessitate the wearing of heavy clothing by Europeans in hot climates, leading to "extravagant sweating," as compared with the "economical sweating" of the pigmented and lightly clothed natives. The loss of water by sweating may be very great. "Four men during a march of seven miles in drill order lost by sweating an average of over three pints (per man) of water. . . . . The healthy body maintains its percentage of water at a constant level, and any excessive loss by sweating must be compensated sooner or later by drinking. . . . It is unwise, therefore, to restrict drinking; a normal thirst is the call for water to maintain the reserves in the tissues." A distinction is drawn between heat-stroke, where the skin is dry, and heat-exhaustion, where there may be excessive sweating. It is possible, where the nervous control of the secretory system is paralysed, as in some toxic states, to have increased vascularity and temperature of the skin without any sweating. It is possible that some unusual product of metabolism, elaborated under the influence of high temperature, may, by acting on the nervous system, induce this condition in heat-stroke. Dr. Pembrey is evidently anxious to avoid any dogmatic expression of opinion on a subject where much close observation and research is still required, but we may be permitted to read between the lines and extract the general tendency of his suggestions as to etiology. Everything points to the mischief being due to a breakdown of the powers of the human organism to regulate its temperature under conditions of great atmospheric heat. The regulating mechanism consists on the one hand of a central nervous control, and on the other of the sweat-secreting mechanism of the skin-surface, acting under the influence of the nervous system. The regulation of body-heat may therefore be interfered with either by the action of abnormal products of metabolism on the controlling centres, or by abnormal external conditions, such as saturation of the air in contact with the skin-surface, which, by preventing evaporation, renders nugatory the activity of a still efficient secretory mechanism. Or again, the secretory apparatus itself may be inefficient, as in the case quoted from ZUNTZ and TENDLAU by Pembrey in his previous article, where the skin was devoid of sweat-glands and the man had to regulate his

temperature by soaking his shirt with water and allowing it to evaporate. It is probable that there is a considerable difference between individuals in their power of adjusting their temperature, and it is certain that a given individual varies in this respect from time to time, the power of heat-regulation being capable of increase by gradual training and liable to diminution under conditions of debility, alcohol, etc. Bearing these points in mind, the rational treatment is to lower the temperature by the application of cold, the use of iced enemata, and the application of ice to the head and neck being especially useful. Diaphoretics are generally without effect. "The success of the treatment by cold is strong evidence in favour of the view that heat-stroke is due to a disordered regulation of temperature produced by heat; the failure of antipyretic drugs can be considered as evidence against the bacterial theory of Sambon." The measures of prevention must be directed to diminishing the production and increasing the loss of heat. Important amongst the former are progressive training, and lightening the equipment or load, as far as possible, during marching or hard work, while amongst the latter are suitability of clothing, marching in open order where possible, ventilation of rooms and an adequate supply of drinking water. "The guidance afforded by the wet-bulb thermometer is more important than that of the dry-bulb. Further attention might be drawn to its indications, which would serve as a warning for special precautions by night as well as by day." The paper contains interesting notes as to the after-effects of, loss of efficiency following, and the cause of death during attacks. The incidence of heat-stroke, sun-stroke and heat-apoplexy in the United Kingdom, India and the Colonies from 1902 to 1906, and of heat-stroke and sun-stroke from 1907 to 1911 (the diagnosis of heat-apoplexy having been dropped after 1906) are given in the form of a table for which the original should be consulted.

[If the percentage of sun-stroke to the total be worked out from the table, the possible error due to the elimination of heat-apoplexy in 1906 does not invalidate this, as such cases were almost certainly added to heat-stroke and not to sun-stroke from 1907 onwards—it will be found that this tends to be fairly constant, only two large variations from the mean (27·7) being found in the ten years examined. This tendency to a constant proportion of sun-stroke cases is difficult to explain if the distinction between heat-stroke and sun-stroke is merely one of fortuitous circumstance.]

S. Lyle Cummins.

Simpson (R. J. S.). **Humidity and Heat Stroke.**—*Jl. R. Army Med. Corps.* 1914. July. Vol. 23. No 1. pp. 1-11. With 2 figs.

In this paper Colonel Simpson examines how far the dictum of Haldane, that "in still and warm air, what matters to the person present is . . . . the temperature shown by the wet bulb thermometer," is applicable to the actual conditions in tropical climates. After a consideration of the factors involved in the alterations in the temperature of a body with an evaporating surface, under the influence of a fluctuating atmospheric temperature and humidity, it is shown that, with the same wet bulb temperature, there may be either a relatively high air temperature with rapid evaporation or a

relatively low air temperature with slow evaporation. "So that a constant wet bulb temperature does not define a constant condition, but one where the rate of evaporation varies as well as the air temperature." Turning now to the rate of evaporation, this is determined by three factors, the temperature, the amount of water vapour present in the surrounding air, and the rate at which the saturated layer of air in contact with the evaporating surface is renewed, i.e. the amount of ventilation. In order to coordinate these factors with the incidence of heat-stroke, the instruments used to compute them should be exposed as nearly as possible under the same conditions as the persons under observation. The fallacies that arise are due to the facts that the temperature of the wet bulb thermometer is not influenced by clothing or by exercise, and is not, therefore, strictly comparable to the human being who is subject to these influences; that meteorological observations are not made contemporaneously with the occurrence of cases of heat-stroke; nor are the elements recorded always strictly comparable. In the *Journal of the Royal Army Medical Corps*, 1908, Vol. 10, p. 25, Leonard Rogers, in a paper of the highest importance, worked out the relationship of the temperature and moisture of the atmosphere to the incidence of heat stroke, using as the basis of his enquiry the incidence of the disease in the British Army in India during three consecutive years and the records of the Bengal Meteorological Office, from which it was possible to obtain the maximum, minimum and mean temperatures and the relative humidity at the places and for the days on which the cases had occurred. Colonel Simpson makes use of these data to ascertain the correlation between the wet bulb temperature and the incidence of cases (Rogers had worked out a percentage of cases under each 10 degrees of moisture for the different mean temperatures). The wet bulb temperature might be worked out from Rogers's data by means of tables but the author finds it simpler to plot out the humidity lines for various combinations of wet and dry bulb temperatures, the result being shown in Fig. 1, in which, if a line be drawn horizontally from the air temperature scale (on left) to the space between the appropriate humidity lines, the wet bulb temperature is vertically below on the bottom scale. The incidence figures of Rogers are inserted opposite the recorded air temperatures (mean) and as near the lower limit of the humidity space as possible. Their position as regards wet bulb reading is thus made diagramatically apparent. In order to have at his disposal a method of finding the absolute humidity corresponding to the various temperatures and relative humidities, Colonel Simpson has constructed Fig. 2. "The horizontal scale of temperature is constructed by plotting the weights of water per cubic metre, and marking the points so obtained with the corresponding temperatures. The increased water content with rising temperature is seen by the widening of the spaces for equal increments of temperature towards the left. The hypotenuse is divided evenly, expressing grammes of water per cubic metre by intervals of five grammes, through which horizontal lines are drawn cutting the temperature and humidity lines. The vertical scale on the left (relative humidity) is evenly divided into ten parts representing differences of ten per cent. Each point is joined to the apex of the triangle on the right by a line which cuts all the temperature lines at points where the relative humidities are the same. Hence we have

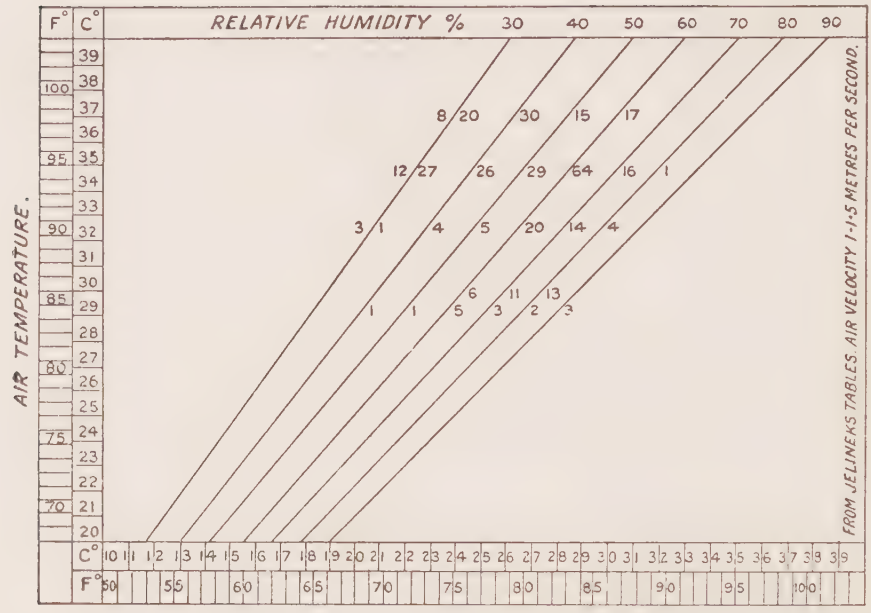

FIG. 1.

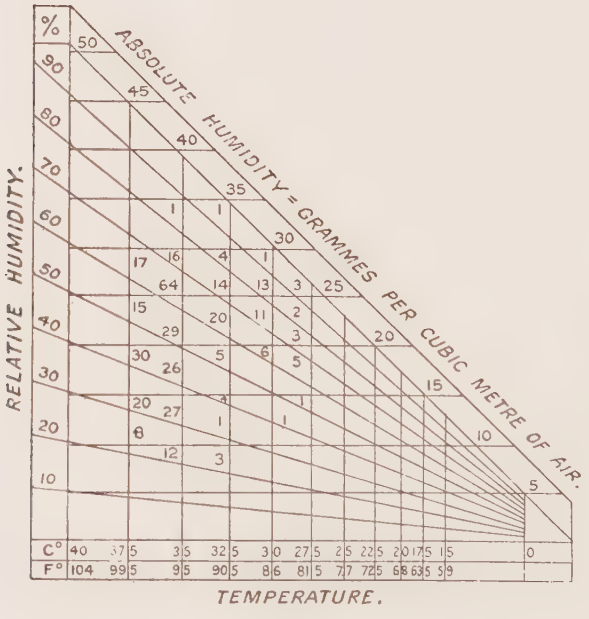

FIG. 2.

[Illustrating summary of SIMPSON'S paper. Reproduced by permission from the *Journal of the Royal Army Medical Corps*, 1914, July.]

a series of approximately diamond-shaped spaces determined by two temperature lines, two humidity lines, and crossed by or included between lines representing weights of water." The distribution of cases according to absolute humidity is obtained by inserting the figures of ROGERS in their appropriate positions. The results of Figs. 1 and 2 are collected in the following table :—

DISTRIBUTION OF ROGERS' CASES, TABLE II, PART 2. TOTAL CASES.

(*a*) *Wet Bulb Temperature.*

Degrees F.	Number.	Percentage.	
68–70	5	1·4	
			·14
70–73	40	11·1	
73–76	37	10·2	
76–79	51	14·1	
			35·4
79–82	94	26·0	
82–85	97	26·4	
85–90	39	10·7	
			63·1
	363		99·9

(*b*) *By Weight of Water per Cubic Metre of Air, in Grammes.*

Grammes.	Number.	Percentage.	
5–10	23	6·3	
			6·3
10–15	54	14·9	
15–20	72	19·8	
			34·7
20–25	80	22·1	
25–30	132	36·3	
30–35	2	0·5	
			58·9
	363		99·9

" The steady increase (of incidence) up to wet bulb temperatures of 76°–79° F. and absolute humidities up to 25 grammes per cubic metre, with a marked increase beyond these limits, is well marked." The author concludes that the results are quite consonant with those of HALDANE'S experiments. HALDANE'S results, then, are applicable to the ordinary climatic conditions of hot climates. Observations on the following points would be useful :

(*a*) Skin temperatures at work and during rest.

(*b*) Rectal temperatures synchronous with (*a*).

(*c*) Skin-shirt layer temperatures, avoiding contact with the skin.

(*d*) Temperatures of the outer surface of the clothing taken in the shade and as far as possible fit for comparison with (*a*), (*b*) and (*c*).

S. L. C.

WANHILL (C. F.). **Factors which may influence the Production of " Heat-Stroke " among Troops on the March or on Service.**—*Jl. R. Army Med. Corps.* 1914. June. Vol. 22. No. 6. pp. 661-664.

In the course of some observations on the relative values of red and white linings for helmets, Major Wanhill had occasion to compare the temperatures inside these helmets when exposed to the sun

and was speedily convinced that not only the direct rays have to be taken into account, but also the heat reflected from walls, the ground and surrounding objects, especially those placed at a level below the edge of the helmet. The great influence of air-currents in reducing the temperature inside the helmet leads the author to lay stress on the importance of proper ventilation around the space between the rim and the head. While the vital question of suitable body-clothing and the regulation of sweating must take the first place, this note on the temperature of the air inside the helmet has a definite importance as throwing light on a detail that is apt to be forgotten. The therapeutic value of direct application of cold to the head and neck makes it probable that the temperature of the air directly in contact with the head is important in prophylaxis also.

S. L. C.

Woolley (Paul G.) **Insolation. Its Prophylaxis and Treatment.** – *New York Med. Jl.* 1914. June 13. Vol. 99. No. 24. pp. 1165-1168.

After a review of the theories of Insolation, a short account of the experimental work of Rubner on the relative importance of radiation and conduction in the elimination of heat from the body, and a description of Aron's work on the effect of direct sun rays on animals, Dr. Woolley concludes that heat-exhaustion, heat-stroke and sun-stroke are merely different degrees of the same condition. He thinks that a classification of cases into mild, severe and hyper-acute would answer all purposes in the present state of our knowledge. Granting that the essential factor in etiology is heat retention due to a failure in the heat-regulating mechanism of the body under conditions of high atmospheric temperature, still another fact of fundamental importance is that "abnormal substances are being produced continuously because of the increased temperature of the body and that these abnormal products (or products in abnormal amounts) are not being eliminated with sufficient rapidity to ensure the body against their deleterious action." To prevent attacks the skin should be kept clean to allow of free sweating, clothes should be suitable, the diet light, alcohol forbidden, plenty of water or citrous drinks should be taken, fatigue, worry, heavy work, and so forth should be avoided. In treatment, while reiterating the importance of cold applications as a means of reducing the raised body-temperature, the author lays great stress on the value of measures directed to encouraging elimination of toxic substances, at the same time replacing the water lost through excessive sweating. For both the latter purposes nothing is more valuable than infusion of saline solution. For rectal use the following is recommended.

Sodium chloride	30 grams.
Sodium carbonate (chrystalline)	20 grams.
Water	1,000 cc.

"The injection should be given slowly enough to allow retention. The time consumed in injecting a litre should not be less than one hour." For intravenous injection a solution of about half the strength of the above is said to be of great value and should be intro-

duced very slowly. In apyrexial attacks of heat-exhaustion, explained by ARON as due to sudden loss of large quantities of water, treatment should be eliminative and stimulating, the infusion of saline solution especially offering a prospect of success. Stress is laid on the need for special precautions by persons recovered from attacks of insolation.

S. L. C.

GROBER. **Behandlung akut bedrohlicher Erkrankungen. Ein Zyklus klinischer Vorträge. VI. Behandlung des Hitzschlags, des Sonnenstichs und der Starkstromverletzungen.** [Treatment of Heat-Stroke, Insolation, and Shock from Electrical Discharges.]—*Deut. Med. Wochenschr.* 1914. Jan. 1. Vol. 40. No. 1. pp. 1-3.

There is nothing in the treatment recommended for the first two conditions that should be new to the worker in the tropics except one rather surprising statement to the effect that it is often worth while to continue artificial respiration for many hours where the breathing has stopped as a result of either heat stroke or insolation. Cases are even said to have recovered after ten or twelve hours of such treatment. [If such cases have been accurately observed and if the fact is as clearly established as the author gives us to understand, then a decided modification of the opinions usually held by English medical men in the tropics is called for, as the persistance in attempts to re-establish respiration must very seldom be continued for anything like these periods. Artificial respiration, continued for half an hour, is advised in the latest edition of CASTELLANI and CHALMERS, and the experience of Army Surgeons in India and elsewhere is in accord with the latter view. The point is one of great importance as, while this divergence of opinion exists, heavy responsibility rests on those called upon to treat the disease.]

S. L. C.

SEGALE (Mario). **Sulla Termocalorimetria del Colpo di Calore.** [On the Thermocalorimetry of Heat-Stroke.]—*Pathologica.* 1913. Oct. 15. Vol. 5. No. 119. pp. 597-602. With 7 charts.

Where a number of cases of heat stroke occur simultaneously and and a common factor is sought, it is generally found that there has existed a high but not necessarily excessive temperature, a temperature, in short that makes possible the saturation of the atmosphere with moisture. This has been noticed by GRANDIS in Buenos Aires, where many cases arose with a temperature of 39·8° C. and a humidity so great that salt and Carlsbad salt deliquesced in contact with the atmospheric air, and by LAMBERT at New York in a series of 805 cases occurring with a temperature of 36·5° C. and a humidity amounting to 70 per cent. of saturation.

Following up his observations on the influence of a humid atmosphere and a raised temperature on the body, GRANDIS carried out experiments on the influence of saturation of the air on the elimination of CO_2 from the lungs, and showed that the latter became steadily less as the degree of saturation of the air became greater. As a deduction from this observation, GRANDIS concluded that hyperpyrexia might arise under similar atmospheric conditions as a

result of the physical factors of the patient's environment. He inferred (1) that where the air is saturated with moisture and its temperature the same as that of the patient, respiration will no longer withdraw heat from the body, because all vaporisation of water from the respiratory surface will have ceased, and with it the rendering latent of heat that forms part of the process of vaporisation. The result will be an actual rise of body heat. (2) Further, when the air is saturated and at a temperature higher than that of the body there will be a tendency to a cooling of the air actually in contact with the respiratory surface of the pulmonary alveoli and, as a consequence, a condensation of moisture on this surface, leading to a liberation of heat and a further addition to the temperature of the patient. Professor Segale, in the paper under review, attempts to bring direct experiment to bear on this hypothesis, and describes a method by which he has been able to record the effect of humidity of the atmosphere, in conjunction with (1) a normal and (2) a raised temperature, on guinea pigs placed in a calorimeter, records being taken of their fluctuations in temperature throughout the experiment. A number of interesting charts illustrate the paper. The author's conclusion is that the hypothesis of GRANDIS is correct. The results of his experiment are as follows :—

Whilst at a temperature of 39° C. with a dry atmosphere a guinea pig lives indefinitely, showing a constant level of emission of heat, at the same temperature and with a humid atmosphere a guinea pig dies, actually absorbing heat from the atmosphere. Finally, at a temperature of 45°–46° C. in a non-saturated atmosphere, the emission of heat is marked and continuous, tending to rise until the moment of death. From the clinical facts and the results of experiment, the following conclusions are drawn :—

(1) Heat-Stroke finds its principal causes and the conditions necessary for its production when the body is exposed to high temperature together with marked humidity of the atmosphere.

(2) Under such conditions, without any initial change in the thermogenetic activity of the body, there is a practical cessation of "loss of heat," leading to a raised temperature. In addition to this cessation of loss of heat there may be a further gain, the body taking up more heat from the air, as already explained.

S. L. C.

BOPPE & ORTICONI. **Syndrome méningé consécutif à une Insolation Simulant une Méningite cérébro-spinale.**—*Arch. de Méd. et de Pharm. Militaire.* 1914. Feb. Vol. 63. No. 2. pp. 209-212. With 1 temperature chart.

An interesting case of Insolation simulating cerebro-spinal meningitis is described in detail by the authors. The point that appears to contrast most markedly with typical attacks of insolation is the length of time that elapsed, after the exposure to sun or heat influence, before symptoms developed. The soldier took part in a severe march on a very hot day (34° C. in the shade) and succeeded in reaching camp without falling out. In the evening he developed a violent headache, was obliged to remain lying down next day, and on rising to urinate on the following night, suddenly collapsed and had to be taken to hospital, where he showed all the symptoms of cerebro-spinal meningitis. The latter disease was excluded by an examination of the cerebro-spinal fluid. The patient recovered completely in a few days.

S. L. C.

BERIBERI.

SHIBAYAMA (S.). **The Present State of the Study of Beri-Beri in Japan.** —*Trans. xvii Intern. Congress of Med.* London. 1913. Sect. xxi. Trop. Med. & Hyg. Pt. 2. pp. 87-90.

During the Russo-Japanese War a severe epidemic of beriberi broke out in the Japanese army and a Commission was formed to study the cause and prevention of the disease. The author and two others were sent to the Dutch Indies and the Straits Settlements to observe the disease as seen there. During a five years' investigation many reports have been published dealing with (1) the experimental study of the beriberi-like disease in birds; (2) prevention of beriberi by cured rice, or a mixed diet of rice and barley; (3) epidemiological observations. With regard to the first, the Japanese experimenters were divided into two groups, some thinking that the avian and human diseases were identical, but the majority disagreed on the ground that although beriberi presents similar symptoms and pathological conditions to a certain degree, it does not always do so, and that birds develop rigidity of the neck, which is never found in human beriberi; moreover the substances which cure birds act less effectually on man. The following table is given to show that neither "the cured rice nor the mixed diet of rice and barley is able absolutely to prevent the disease, though they seem to play some part." [From the figures it would not be unjustifiable to replace "some" by "very important."]

Main Diet.	No. of Inhabitants experimented on.	No. of Patients.	Per-centage.
Cured rice	657	8	1·22
Rice (6 parts) .. .. / Barley (4 parts)	534	19	3·56
White rice (control) ..	710	64	9.01

In cities the disease is never epidemic, but among coal miners, fishermen, railway labourers and prisoners it is often very severe, breaking out in epidemic form from time to time. The disease prevails among those who use rice as their staple diet, but all the labourers who eat rice and live under similar conditions do not suffer. It is also pointed out that a seasonal prevalence is well marked. The disease begins to appear in May or June and is worst in July, August and September, disappearing in the cool autumn; it breaks out heavily one year, and may not be present in the next under similar dietetic and hygienic conditions. In summing up the author states that the Japanese investigators have not yet been able to arrive at any conclusion. Though faulty diet may give rise to the onset of the symptoms, it cannot be regarded as the cause of the disease, the general opinion being that it is due to an "intoxication by a poison which is produced by a certain kind of micro-organism in the human body, especially the intestine."

P. W. Bassett-Smith.

Dubois (A.) & Corin (G.). **Rapport sur une petite Epidémie de Béribéri à Bokala (Congo Belge).**—*Bull. Soc. Path. Exot.* 1914. May. Vol. 7. No. 5. pp. 402-405.

Small epidemics of beriberi have been frequently notified from Western Africa, though rarely from the Congo district. The one here described consisted of nine cases, all of which were benign in character. The signs and symptoms of each of these are briefly given—consisting of pains in the legs, oedema, abolition of reflexes, tachycardia and precordial pains; ankylostome ova were commonly present, but were of secondary importance. These nine cases were from among 199 employees and they commenced to appear at the end of the dry season. After their removal to the hospital at Leopoldville no fresh cases occurred. The use of rice in the diet had been stopped four or five months before the onset of the epidemic. The rations were abundant at Bokala, consisting mostly of manioc with addition of fresh meat at least once a week, also vegetables and fruit—being better than those given at Leopoldville. Believing the disease to be caused by an infective agent, Dubois attempted to produce the condition experimentally in man and animals. Six men in late stages of trypanosomiasis, but free from any signs of beriberi, were injected subcutaneously with 1–2 cc. of citrated blood from two of the cases of beriberi, none of these developed any signs of the latter disease. A guinea-pig was also inoculated with 10 cc. of blood, with negative results. The authors state that these results agree with the experiences of others; yet they do not prove that beriberi is non-infectious, but only that the infectious stage has ceased on the appearance of the symptoms, or that the infective agent is localised in the digestive tract.

P. W. B.-S.

Middleton (E. M.). **A Case of Beriberi complicated by Duodenal Ulcer.**—*Jl. R. Army Med. Corps.* 1914. May. Vol. 22. No. 5. pp. 589-591.

A sapper, who in September 1912 had been operated on at Dover for gangrenous appendicitis, was on recovery sent to Sierra Leone. Six weeks after his arrival he was admitted to the hospital there with beriberi and was invalided to England. The symptoms of the disease, except for a loss of patella reflexes, had all cleared up in three months, but he was again admitted to hospital, this time with evidences of duodenal ulcer, from which he died.

[The description is too meagre to be able to state definitely that this man had true beriberi, which is hardly likely to have been contracted in so short a time in a man direct from England. The disease too is uncommon in Sierra Leone.]

P. W. B.-S.

Fenton (E. G.). **The Etiology of Beriberi.**—*Brit. Med. Jl.* 1914. April 25. p. 914.

In Southern Nigeria, where the author has had considerable experience, a form of polyneuritis is more or less constantly present. He states that among the Krooboys, who generally had a half-starved appearance when joining, but after a few months got both fat and

strong, each batch would produce a few of these cases, some of whom died. Their diet was to a large extent polished rice, but was supplemented with many extras; one cook prepared the food for all. A fair number of Europeans who did not use rice suffered from the same disease; in these there was some oedema besides the neuritis; only one died, who would not leave the endemic area, the fatal result being from sudden heart failure with cyanosis. The author states that if these were not true beriberi as found in the Far East, there must be some form of endemic polyneuritis not hitherto described.

P. W. B.-S.

Braddon (W. Leonard). **On Some of the Results of Measures taken against Beriberi in British Malaya.**—*Trans. xvii Intern. Congress of Med.* London. 1913. Sect. xxi. Trop. Med. & Hyg. Pt. 2. pp. 91-114.

In this long and interesting paper the author shows how by the application of the researches of many investigators, himself being one of the pioneers, not only have the frightful ravages of beriberi been prevented, but affected persons have been restored to health by the simple expedient of changing one single article of food, namely the substitution of one commercial variety of rice for another. Full justice is given to the early work of Eijkman, Van Leent, Van Dieren, Grijns and others. In 1901 the author first definitely put forward the rice theory and later by practical experience carried it into successful operation. This preceded the valuable experimental work of Schaumann, Aron, Holst, Fraser and Stanton, and others. He states that "the intimate nature of the mechanism whereby the abstraction of the vitamine from the food entails beriberi is of the highest theoretical, but of less (at present) practical interest. For the hygienist in the tropics it is sufficient to have established the important fact that rice of a certain sort, or rice in a certain condition, *when used for the only purpose for which it ever is used* by the native, namely as a staple article of his diet, produces beriberi—it is therefore noxious to him, a poisonous food." A very large amount of detail is given, with statistical tables showing how in different places—prisons, asylums, hospitals, &c.—the case incidence and mortality have been prevented or enormously reduced by the dietetic methods alone. A survey of the statistics for the whole of the hospitals taken together shows that since the change of rice has become general, the total mortality has been reduced by two-thirds, from a mean average of 30 to 10 per cent. of those treated. As some 10,000 cases are treated every year this means a saving of 2,000 lives annually in British Malayan hospitals alone; yet even now every year it is estimated that 20,000 deaths take place from beriberi in the British Malayan area. In conclusion the author states that the cause of all this terrible sickness and mortality is a wholly needless and remediable error in diet, the remedy is also known and is everywhere applicable; let but this over-milling of the rice used by the natives be everywhere prevented, and the disease will be stamped out. At the conclusion of the meeting, Dr. Braddon brought forward a number of resolutions

which, after discussion and consideration, were finally passed in the following form :—

"1. In the opinion of the Tropical Diseases Section, beriberi amongst natives whose staple food is rice is induced by the continued and too exclusive consumption of the grain in a highly milled form, by which treatment the cortical and subcortical layers are completely removed.

"2. The Section urges upon all authorities responsible for the health of native communities the encouragement by every means in their power of the restriction of rice of this character for coolies.

"3. In view of the proved non-infectiousness of beriberi, this Section suggests to all port and sanitary authorities the propriety of abolishing quarantine and other restrictive measures at present in operation."

P. W. B.-S.

Braddon (W. L.) & Cooper (E. A.). **The Influence of the Total Fuel-Value of Dietary upon the Quantity of Vitamine required to prevent Beriberi. (Preliminary communication.)**—*Brit. Med. Jl.* 1914. June 20. pp. 1348-1349.

The authors who are now carrying out feeding experiments with birds to throw more light on the deficiency theory of beriberi, point out that various experimenters have shown that the onset of beriberi symptoms depends not only on the deficiency of vitamines in the food but that the relative amount of these substances bears a definite proportion to the carbohydrate material. A bird receiving $\frac{1}{20}$ of its body weight of polished rice and $\frac{1}{2500}$ of dried yeast will develop polyneuritis in 39–95 days, if the quantity is increased to $\frac{1}{10}$ it falls ill in 22–46 days, that is, by doubling the carbohydrate ration, the onset of the disease is hastened in spite of the fact that there would also be a total, though small, increase of vitamines ingested with the rice. The results obtained demonstrate that the amount of anti-neuritic substance required increases with the amount of carbohydrate ingested. The explanation of this, suggested by Funk, is that the active substance is required for carbohydrate metabolism; the more carbohydrate ingested the more vitamine will be necessary. Experiments by the authors showed that when chickens were fed daily with $\frac{1}{10}$ their body weight of polished rice and a small quantity of dried yeast, 93–98 per cent. of the starch was taken up, and the excreta were free from antineuritic substance; also that birds fed exclusively on glucose, which is rapidly absorbed, develop neuritis. These observations show that the anti-neuritic substance is utilized in some way during carbohydrate metabolism and that the destruction of the substance is not due to any physical factor. It is important in drawing up a dietary not only to regulate the absolute amount of anti-neuritic substance given, but also the proportion which this bears to the total calorific value of the diet, if we wish to prevent the onset of beriberi.

[The full paper, which is shortly to be published describing the experiments, will be read with interest.]

P. W. B.-S.

Funk (Casimir) & Douglas (Mackenzie). **Studies on Beriberi. viii. The Relationship of Beri-beri to Glands of Internal Secretion.**—*Jl. of Physiology.* 1914. Feb. 27. Vol. 47. No. 6. pp. 475-478.

A close relationship between food vitamines and the glands of

internal secretion is believed to exist by Funk ; he therefore thought that some histological evidence would be found in these glands in cases of deficiency disease. To demonstrate this a careful examination was made of eight pigeons which were suffering from the artificially induced disease, and the authors summarise the results found as follows :—" The glands examined showed a great diminution in size in every case. Microscopically there was a marked degenerative change of the cells with higher functions. In most cases the marked atrophy was due to a disappearance of the cells, the framework of the gland alone remaining. The most marked change was in the disappearance of the thymus."

P. W. B.-S.

Funk (Casimir). i. **Studien über Beriberi. x. Mitteilung Experimentelle Beweise gegen die toxische Theorie der Beriberi.** [Studies on Beriberi. 10th Communication. Experimental Evidence against the Toxic Theory.]—*Hoppe-Seyler's Zeitschr. f. physiol. Chemie.* 1914. Feb. 28. Vol. 89. No. 5. pp. 373-377.

ii. **Studien über Beriberi. xi. Mitteilung. Die Rolle der Vitamine beim Kohlenhydrat-Stoffwechsel.** [The Rôle of Vitamines in Carbo-Hydrate Metabolism.]—*Ibid.* pp. 378-380.

i. The theory that beriberi is an intoxication disease has been largely brought forward in Germany. Last year Abderhalden and Lampé reported that pigeons fed on boiled rice developed beriberi much later than when fed on unboiled rice ; this they thought was due to the process of boiling destroying some poisonous property in the rice. Caspari and Moszkowski believed that a poison was formed in the body after ingestion of the rice. Three years ago Cooper and Funk showed in their experiments that rice contained no poison and that starch, inuline, lactose, cane sugar and dextrine could produce typical beriberi in birds. The author carried out a first series of experiments on pigeons fed on boiled and unboiled rice, a second series using a synthetic dietary of casein, fat, starch, sugar, and salts in a mixture similar to that used by Osborne and Mendel for their experiments on growth, and a third series to determine the vitamine content of beriberi pigeons. In this last experiment four healthy and four beriberi pigeons were finely minced up and their tissues extracted with alcohol in the cold. The results were very interesting, showing that the total supply of vitamines cannot be entirely removed in the diseased birds, but that the animal robs the vital organs of vitamine first, causing a fatal issue. The following conclusions are given :—

(1) Experimental beriberi develops in the same time with boiled and unboiled rice, provided equal amounts are given.

(2) A mixture of casein, fat, starch, sugar and salts produces beriberi. Commercial casein contains traces of vitamines, and if these are destroyed by boiling or removed by extracting with alcohol, the onset of beriberi is considerably hastened.

(3) Alcoholic extracts of beriberi pigeons can cure beriberi pigeons without producing any poisoning action. The animals get beriberi without entirely exhausting the supply of vitamines in the body.

ii. Funk has previously suggested that vitamines play an active part in the assimilation of food, as it was found that by increasing

the supply of food the onset of beriberi was hastened. The problem was to find out which constituent of food requires the vitamines for its assimilation. In human beriberi the disease arises particularly on carbohydrate dietary—rice, sago, white bread, etc. These known facts and the proof that pure carbohydrates could produce the disease suggested the idea that vitamines play an active part in carbohydrate metabolism. Pigeons were fed on polished rice, ½, 5, 10 and 20 grams daily; those on the 20 grams first became ill, then those on 10, later those on 5; those that received only ½ gram died of pure starvation, showing no sign of beriberi, thus demonstrating that in starvation little or no vitamines are consumed owing to the retardation of metabolism. A second experiment with artificially composed food showed that starch and sugar used up most vitamines. Four series of eight pigeons were placed on the following diets :—

	Salt.	Casein.	Sugar.	Fat.	Starch.
A ..	4	60	12	12	12
B ..	4	12	12	60	12
C ..	4	12	12	12	60
D ..	4	12	12	60	12

Each pigeon received 12·5 grams of its mixture in a pill form. The onset of beriberi showed itself as follows :—

	A	B	C	D
	Casein.	Fat.	Starch.	Sugar.
Onset ..	30th.	40th.	24th.	28th day.

Conclusions. (1) Increasing amounts of foodstuffs rich in carbohydrates hasten the onset of beriberi.

(2) Addition of carbohydrates to a standard dietary and especially starch and sugar, hastens the onset of beriberi, which points to vitamines playing an active part in carbohydrate metabolism.

(3) The vitamines obviously play a more important rôle in starch metabolism than in that of the other constituents of the dietary.

P. W. B.-S.

Gibson (R. B.). **The Influence of Compensated Salt Mixtures on the Development of Polyneuritis Gallinarum and Beriberi.**—*Philippine Jl. of Science.* Sect. B., Trop. Med. 1913: Oct. Vol. 8. No. 5. pp. 351-367. With 4 plates.

After an historical review of the deficiency theory of beriberi, and the determination of the essential factor missing, the author concludes that white rice with properly balanced mineral ingredients should prevent beriberi, provided the rice protein is nutritively adequate. After making a careful analysis of the rice, a salt mixture was prepared which, when added, brought the food up to that estimated as necessary in Osborne and Mendel's experiments. Fowls and monkeys were used for the experiments. Polyneuritis gallinarum was not prevented in the treated fowls, but the onset was slightly delayed and the degenerative changes in the nerves were less pronounced. Two fowls which received an excess of calcium and sodium lactate with the food did best; one actually gained weight during the first week, but it died on the 33rd day. The monkeys under treatment lost weight and developed neuritis equally with the controls.

P. W. B.-S.

Schnyder (K.). **Pathologisch-anatomische Untersuchungen bei experimenteller Beriberi. (Reispolyneuritis).**—*Arch. f. Verdauungs-Krankht.* 1914. Apr. 15. Vol. 20. No. 2. pp. 147-178.

This investigation was instituted to prove whether the anatomical changes found in animals with experimental beriberi were the same as those that have been shown to take place in human beriberi. A large number of mice (33), with 3 hens, 2 pigeons, 4 dogs and 2 cats were used, a neuritis producing food of varying character being given for considerable periods. In the mice the anatomical changes in the brain were not marked, the heart showed signs of dilatation and incompetency, the liver showed congestion and pigmentation with vacuoles containing glycogen; the most noticeable fact was the complete absence of fat from the liver. There were no changes in the cord and the sensory nerves showed no signs of organic degeneration. [These results thus differ from similar observations made by many other experimenters.] In the dogs degenerative changes were found in the nerves, but very rarely (2 out of 20) were like those found in human beriberi. The author states that he was very much surprised at the small amount of degenerative changes in the birds, which was in direct contradiction to that observed by Funk; the same applied to the cats and all but the last dog, the reason probably being that death follows too soon after the first appearance of paretic symptoms for definite changes to develop in the nerves. In most cases the animals could be cured by administration of rice bran extract, showing that the paresis was not due to degenerative changes in the nerves. In conclusion the author states that etiologically and clinically the diseases of man and animals are identical, but pathologically the appearances are different. Further experiments are required to bring these observations more into line and he thinks it is necessary for the disease to be made to take as long a course in animals as it does in man, which might be brought about by providing a very small amount of vitamine in the food, enough to save life, but not to prevent the disease; a condition which probably naturally occurs in many natives living on rice.

P. W. B.-S.

Gibson (R. B.). **The Protective Power of Normal Human Milk against Polyneuritis Gallinarum (Beriberi).**—*Philippine Jl. of Science. Sect. B. Trop. Med.* 1913. Dec. Vol. 8. No. 6. pp. 469-471.

Infantile beriberi, which is so common in the Philippines, has been considered by Andrews and others to be, in great part, due to a deficiency in the mother's milk of vitamines or protective substances against the disease. The experiments recorded in this paper were instituted by the author to prove whether human milk possessed any protective properties when given to fowls fed on polished rice. Vedder and Clark have shown that when 5 cc. of fresh cows' milk was added to the polished rice diet of fowls a partial protection was obtained, but that with canned milk there was little or none. For this experiment the human milk was taken from women in the obstretric ward of the Philippine General Hospital, three days or more after parturition. Eleven fowls were fed daily on 50 grams of polished rice, to which was

added 5 cc., 10 cc., or 20 cc. of the milk, a fourth group having only the rice ; occasionally the proper amount of milk was not obtainable, but from the 27th to the 40th day there was plenty. The daily record is given in a table. This indicates that the addition of 5 or 10 cc. of milk to the polished rice did not prevent polyneuritis, and one fowl receiving 20 cc. showed on the fourth day mild, though typical, signs of neuritis. It appears, therefore, that human milk contains not more than one-fourth of the amount of vitamines found in fresh cows' milk. It is also pointed out that the histological examination of the nerves on about the twentieth day would be the most exact method of determining whether a bird was protected or not.

P. W.B.-S.

Cooper (E. A.). **On the Protective and Curative Properties of Certain Foodstuffs against Polyneuritis induced in Birds by a Diet of Polished Rice.**—*Jl. of Hygiene.*, 1914. Apr. Vol. 14. No. 1. pp. 12-22.

This is a continuation of the author's studies on the causes, prevention, and cure of polyneuritis in pigeons. The present series were carried out to obtain information as to the relative efficacy of various foodstuffs for preventing beriberi, and to ascertain still further the distribution of the anti-neuritic substances in animal and vegetable tissues. His results are extremely interesting. The summary is here given in extenso.

"1. Pigeons fed on daily rations of polished rice equal to 1/20th their initial body-weight develop symptoms of polyneuritis in about three weeks and usually lose considerably in weight.

"2. The efficacies of various ox-tissues for preventing polyneuritis have been determined, and the tissues arranged according to their anti-neuritic powers are in the following descending order :—liver, cardiac-muscle, cerebrum, cerebellum, voluntary muscle, and (cows') milk.

"3. Alcoholic extracts of the excreta of a hen fed on unpolished grain and of the faeces of a rabbit fed on bread and cabbage cured polyneuritis in pigeons. The whole content of anti-neuritic substances present in the dietary was therefore not absorbed or else some amount is synthesised by the bacteria of which the faeces consisted to a considerable extent. No conclusions can consequently be drawn as to the actual distribution of the active substances in the animal body, until the extent to which the various tissues are absorbed from the alimentary canal of birds has been determined.

"4. Nuts (husked filberts) are very efficient in preventing polyneuritis, being even superior to lentils and husked barley. Cheddar cheese, on the other hand, even in considerable amount, has no preventive effect.

"5. Malt extract taken from two different samples readily cured polyneuritis in pigeons. A third sample, however, even in large doses had no curative action.

"6. For the prevention of beriberi egg-yolk, heart-muscle, liver, nuts, barley, and lentils can be recommended as suitable foodstuffs with which to supplement the polished rice diet. As meat (voluntary muscle) has been frequently found to be ineffective in preventing epidemics of beriberi, its replacement by heart and liver in mixed diets would be a considerable improvement, because, not only are these tissues when suitably prepared as nutritious as voluntary muscle, but they also contain the anti-neuritic substances in much higher concentration."

P. W.B.-S.

YELLOW FEVER.

Lafont & Cadet. **Paludisme et Fièvre jaune en Afrique Occidentale française. Etude de leurs Formules Leucocytaires et Comparaison avec celles de quelques autres Maladies,**—*Ann. d'Hyg. et Méd. Coloniales.* 1913. Oct.-Nov.-Dec. Vol. 16. No. 4. pp. 1068-1106.

An examination of ten cases of jellow fever in West Africa in 1912 has led the authors to compare the blood condition found with that of malaria. The blood findings in the ten cases of yellow fever have led the authors to the following conclusions :—

1. Malarial parasites were always absent.

2. The eosinophiles disappeared from the blood and if this disappearance persisted the case ended fatally.

3. The leucocyte formula was much changed and varied considerably. Sometimes there was a marked leucopenia, at others a hyperleucocytosis. It is difficult to judge to what extent these variations are due to treatment.

4. There seems to exist some relation between the extent of the leucopenia and the degree of albuminuria.

5. The large mononuclears are increased to 16, 19, 20, 23, and 28 per cent.

6. The leucocytes themselves seem altered in that they, especially the polymorphonuclears, have an acidophile protoplasm. The nuclei are often thick and swollen to such an extent that they may fill the entire cytoplasm.

7. The red blood corpuscles contain granulations which are either punctiform or elongate and often surrounded by an areola. As regards their nature it is impossible to state whether they are inclusions, cell alterations, small intracorpuscular parasites, or remains of malarial parasites.

With reference to the blood condition in malaria it is found that the hypoeosinophilia is absent while a leucocytosis is rarely observed at the commencement of a malarial attack. The leucocytes are not greatly altered in appearance. If malarial parasites are to produce an attack as severe as the onset of yellow fever then they will be numerous in the blood and easily recognised. Whether an attack of yellow fever will completely cover a previous malarial infection is a subject for future enquiry.

In variola there is also a fall in the number of eosinophiles which is more marked in grave and fatal cases. The hyperleucocytosis, however, is a feature more marked than in either malaria or yellow fever. In trypanosomiasis there is an increase of eosinophiles as well as mononuclears.

The authors point out that a study of yellow fever in Martinique by Noc led him to similar results as to the blood condition in this disease (see this *Bulletin*, Vol. 2, p. 21).

C. M. Wenyon.

Fajardo (Diego Hernandez). **Un Caso de Fiebre Amarille en un Nativo de Yucatán.** [A Case of Yellow Fever in a Native of Yucatan.]—*Revista Med. de Yucatan.* 1914. Jan. Vol. 9. No. 3. pp. 53-58.

The case recorded was in a native of Yucatan aged 10 years. The disease was of seven days' duration and in every way resembled a typical attack of yellow fever. Jaundice was marked, there was

vomiting of black haemorrhagic material and albuminuria (50 centigrams per litre) was present. Most careful examination of the blood failed to reveal malarial parasites, but this might have been due to the quinine injections which were given. The temperature which ran up to 39° C. fell to 36° before death. The pulse rate fluctuated between 90 and 100.

At the post mortem it was found that the liver was of a yellow colour, soft and friable. All the organs were yellowish and were considered to be in a condition of fatty change. The kidneys were hyperaemic and showed yellow patches of fatty degeneration. The stomach showed punctiform ecchymoses and areas of hyperaemia The contents were of a haemorrhagic colour and contained in suspension fragments of mucosa. The intestine contained black material and showed a general haemorrhagic enterocolitis. The enlarged spleen had a normal colour. There was hyperaemia of the meninges and myocarditis due to a fatty degeneration in the myocardium. The pathological diagnosis was one of yellow fever.

The author states that in all the blood films there was present the parasite described by SEIDELIN under the name of *Paraplasma flavigenum.*

C. M. W.

GUITERAS (Juan). **Endemicity of Yellow Fever.** [Correspondence.]—*Yellow Fever Bureau Bull.* 1914. Apr. 7. Vol. 3. No. 2. pp. 110-113.

In his report on " vomiting sickness " in Jamaica SEIDELIN reported one fatal case in a Chinaman as being undoubtedly yellow fever (see this *Bulletin*, Vol. 3, p. 184). Guiteras now disputes the diagnosis of this case and points out various features which make it very improbable that the case was one of the disease. The absence of temperature, the pulse rate, lack of intense jaundice, together with the fact that the man was a Chinaman lead him to conclude that the diagnosis was incorrect. SEIDELIN replies that he is still convinced of his diagnosis (he found Paraplasma in the blood) though in some points the disease did not correspond to the classical type.

C. M. W.

LOW (R. Bruce). **A Brief Account of the Incidence of Yellow Fever throughout the World during 1911-1912.**—*Forty-Second Ann. Report of the Local Govt. Board. 1912-13.* Supplement containing Report of Medical Officer for 1912-13. Appendix A. No. 3, pp. 148-170. With a Map. 1914. London: Printed under the Authority of H. M. Stationery Office. [Cd. 7181.]

This paper of 22 pages is full of interesting matter relating to the occurrence of yellow fever throughout the world not only in the years 1911 and 1912 but before that time. The information has been gathered from many sources and is presented in such concentrated form that it is impossible still further to condense it. After a general introduction the various states of South and Central America are considered in detail—Brazil, Venezuela, Chili, Peru, Ecuador, Columbia, Panama Canal Zone, Honduras, Mexico, West Indies. The occurrence of yellow fever in West Africa is treated under the headings—Senegal,

Gambia, Portuguese Guinea, Sierra Leone, Gold Coast, Togoland, Dahomey—in all of which cases of the disease have been reported during the period under review. The paper is well worth the attention of those interested in the spread and prevention of yellow fever.

C. M. W.

AGRAMONTE (Aristides). **Observations upon a So-called Parasite of Yellow Fever.**—*Trans. xvii Intern. Congress of Med.* London. 1913. Sect. xxi. Trop. Med. & Hyg. Pt. 2. pp. 71-81.

In this paper the author reiterates his disbelief in the parasitic nature of the bodies (Paraplasma) described from cases of yellow fever by SEIDELIN. The author points out that the role played by the Stegomyia mosquito in the transmission of the disease is perfectly familiar to him and, as SEIDELIN'S bodies do not conform to what is already known as regards this or the period of infectivity in man, he cannot accept the bodies as the parasite of yellow fever. In the first place the bodies have been found in many conditions other than yellow fever though the author points out that SEIDELIN places himself in a unique and invulnerable position by declaring that some of these bodies shown him were not exactly like the ones in his preparations. Agramonte justly remarks, however, that there are no two things exactly alike upon the face of the earth, and in dealing with such extremely small objects artificially coloured a great similarity or a close resemblance should be accepted—all other conditions being equal —as evidence of identity.

In the second place the Seidelin bodies should not be able to pass a Berkefeld filter while the virus of yellow fever certainly does. It is pointed out also that in his early papers SEIDELIN reported having only found the bodies late in the disease and not in the early stages when the blood is infective. He assumed therefore that during the infective stage the parasites were invisible. In the later reports he claims to have found the parasite from the very beginning of the disease. The author also draws attention to the fact that SEIDELIN has found his bodies in many cases which have presented no signs of yellow fever and in his own blood he found them for a second time within two years and assumed that he had suffered from a second attack of yellow fever. The sanitary authorities, however, refused to recognise his case as one of the disease. In connection with the possible inoculation into guinea-pigs the author records having seen similar bodies in guinea-pigs treated with human blood. C. M. W.

VILLEJEAN (A.). **Fièvre jaune et " Vomiting Sickness " à la Jamaique.** —*Revue de Méd. et d'Hyg. Trop.* 1914. Vol. 11. No. 1. pp. 27-34.

This paper contains a review of the history of the vomiting sickness of Jamaica up to the time of SEIDELIN'S investigations which failed to establish its supposed connection with yellow fever. The author then discusses the endemicity of yellow fever in various parts of the world. He thinks that the existence of the disease in benign form amongst the natives, particularly in children, explains the majority of facts connected with the persistence of the disease in endemic centres and the occurrence of outbreaks at more or less frequent intervals.

C. M. W.

BALFOUR (Andrew). **The Wild Monkey as a Reservoir of the Virus of Yellow Fever.**—*Lancet.* 1914. Apr. 25. pp. 1176–1178.

The author discovered amongst the natives of Trinidad a belief that an outbreak of yellow fever is preceded by some fatal epidemic amongst the red howler monkeys. In connection with a recent mysterious outbreak of the disease at Brighton in the south west of Trinidad it was found that the first cases occurred at a place where these monkeys are found and information was obtained that before the last great outbreak many of the monkeys died of the disease. As regards the recent epidemic there was no indication that monkeys had died before it broke out. (There was no possibility of the disease having been imported.) On enquiries instituted at Maracaibo (Venezuela) it was found that the most recent cases of yellow fever had occurred in Maracaibo itself while monkeys were only found 50 miles distant. Still the author thinks that the conditions in Trinidad are of such interest as to make it worth while to follow up the question of a possible monkey reservoir for the parasite of yellow fever.

C. M. W.

LOW (George C.). **Monkeys as Reservoirs for the Virus of Yellow Fever.** [Correspondence.]—*Lancet.* 1914. May 9. pp. 1357–1358.

In this letter to the Editor it is pointed out that during an epidemic of yellow fever in St. Lucia in 1901 there was no indication that any animal host of the virus occurred. Similar investigations in Cuba and Barbados all lead to the same result, namely, that when once the disease is stamped out it does not recur until some chance importation of an infected individual or mosquito takes place. There is no evidence to indicate that the parasite, whatever it may be, survives in the blood of some animal host. In the West Indies the possibility of wild monkeys acting as reservoirs is very small indeed, as in most places—Barbados for instance—the monkeys where they occur are far away from the towns. The monkeys of Barbados are not red howling monkeys. In British Guiana where these monkeys are common cases of yellow fever are not met with amongst the non-immunes who traverse those areas.

Referring to the small epidemic mentioned in Dr. BALFOUR'S paper as occurring at Brighton in Trinidad the writer cannot agree that all possibility of importation had been excluded. The first case was in a man who had arrived there from the Venezuelan mainland five days before being struck down. To the writer it appears clear that he acquired the infection in Venezuela or on the journey to Trinidad. As regards the sporadic cases of so-called yellow fever which crop up from time to time in endemic areas, it is doubtful if all these have been genuine cases of the disease since in many instances no necropsies were performed.

Referring to the bodies described from the blood of guinea-pigs and dogs by MACFIE and JOHNSTON [see below] the writer remarks that their discovery in monkeys would mean nothing as it has yet to be proved that they are parasites and, if so, that they are the cause of yellow fever. Recently the writer has examined the blood of guinea-

pigs in England in conjunction with WENYON and they have observed bodies very similar to those described by the two observers just mentioned.

C. M. W.

MACFIE (J. W. Scott) & JOHNSTON (J. E. L.). **Experiments and Observations on Yellow Fever.**—*Proc. Roy. Soc. Med.* 1914. Jan. Vol. 7. No. 3. Medical Section, pp. 49–67. With 5 figs. and 4 charts ; and *Yellow Fever Bureau Bull.* 1914. Apr. 7. Vol. 3. No. 2. pp. 121–144. With 1 coloured plate and 7 charts.

These two papers are the same except that the second one is illustrated by a beautiful plate drawn by Miss M. RHODES showing the Paraplasma-like bodies from the blood of man, guinea-pigs, dogs and rats.

The papers open by stating that the experiments and observations were made at the Medical Research Institute, Yaba, near Lagos, Southern Nigeria, during the course of an epidemic of yellow fever at Lagos which commenced in May 1913 and was still in progress when the papers were written in September, 1913.

The authors point out that the cases of yellow fever in this epidemic fall chronologically into two groups, each of which was ushered in by a fatal case in a European. The first six cases occurred in May, the remaining seventeen in July and August. Up to September 1913, there had been four cases in Europeans, sixteen in natives and three in Syrians. Of the natives six were Kroo-boys. In the Europeans the disease presented all the classical symptoms and two of them died. Of the Syrians two died on the fifth day while the third case though not fatal was of a serious type. The symptoms in the natives were far from typical, but the authors point out that according to SEIDELIN this is the rule rather than the exception.

The Occurrence of Paraplasma-like Bodies in the Blood.—The authors have examined the blood from nineteen cases of yellow fever and have found the bodies in sixteen. In some cases they were very scarce, but in others they were by no means rare and were more common than malarial parasites are in adult natives suffering from mild attacks of malarial fever, in whom it is often extremely difficult to find conclusive evidence of infection. In one case, in a native, films were examined every day for twelve days and bodies were found on eleven of these days to be present in the blood. The bodies illustrated in the coloured plate resemble those in the plates accompanying SEIDELIN'S original articles. As regards their appearance in the plate, they resemble some of the smaller forms of the piroplasmata (Theileria) or very minute malarial rings, being smaller than the ordinary rings of subtertian malaria.

Observations on Guinea-pigs.—THOMAS (1907) produced a reaction in guinea-pigs from four and a half to thirteen days after they had been bitten by infected Stegomyia and SEIDELIN observed bodies resembling *Paraplasma flavigenum* in two guinea-pigs inoculated by him from a case of yellow fever.

The authors experimenting with these animals inoculated 14 from 11 cases of yellow fever. In each case only one or two drops of human blood, diluted with 1 per cent. sodium citrate solution, were used for

subcutaneous injection. Ten of the animals showed a definite febrile reaction. Three guinea-pigs inoculated with normal human blood showed no reaction. Positive results have been obtained by inoculation made as late as the eighth day of the disease. The febrile reaction, detected by taking the temperature daily per rectum at 5 p.m., was definite and quite different from the oscillations seen in healthy animals. No other symptoms were noted in the animals, though three died suddenly on the 16th, 20th, and 38th day after inoculation. The latter animals all had congested livers and as only these animals died the authors feel justified in attributing their death to the inoculation of the yellow fever blood. All the guinea-pigs save one showed Paraplasma-like bodies in the blood, while no such bodies were found in uninoculated animals. One guinea-pig was subinoculated from another guinea-pig. It gave a well marked febrile reaction and showed the bodies in the blood.

Observations on Dogs.—Five puppies were inoculated. There was no febrile reaction, but bodies were found in the blood of four of them. Further in the blood of two of eleven stray dogs from Lagos paraplasma-like bodies were found. As a result the authors suggest the possibility of dogs being carriers of yellow fever.

Observations on Rats.—Two rats were inoculated from two cases of yellow fever. Paraplasma-like bodies were found in both. One showed some degree of fever after inoculation.

The examination of fowls as possible carriers of *Paraplasma flavigenum* gave only negative results.

Seidelin has examined the bodies found in man and animals by the authors and agrees that they are identical with his own *Paraplasma flavigenum.* C. M. W.

Valladares (Prado). **Tratamento racional da Febre Amarella (Reflexoes e suggestoes).** [The Rational Treatment of Yellow Fever (Reflections and Suggestions).]—*Brazil Medico.* 1914. **Apr. 22. Vol. 28. No. 16. pp. 153–157.**

The author puts forward the following suggestions for the treatment of yellow fever, based upon the clinical features of the disease.

1. During the first three days of the attack, while the virus is still circulating in the blood, recourse should be had to venesection combined with the injection of isotonic salt solution, and to lumbar puncture, in order to promote the circulation of antibodies. The usual derivative treatment may be practised in addition.

2. In the second stage the functions of the liver should be stimulated by the administration of alkalies, benzoate of soda and sulphuric ether. Enemata of cold water should also be given twice a day.

3. Adrenalin should be resorted to as soon as the fall in blood pressure shows that the functions of the suprarenal bodies are becoming impaired.

4. The renal-vein serum of Teissier should be employed to combat symptoms of anuria.

5. Bathing should be employed whenever the temperature rises above 39° C. in the absence of any indications to the contrary.

Attention is also called to a clinical symptom of very bad augury, already pointed out by Frederico Koch, namely the occurrence of an ulcerating phlyctenule upon the cornea at the level of the external palpebral fissure, which distils a liquid like tears. J. B. Nias.

Lalor (N. P. O'Gorman) & Stewart (D.D.). **Report upon the Prevalence of *Stegomyia fasciata* at the Principal Seaports and Seaport Towns in Burma.**—viii + 41 pp. 1913. Rangoon: Office of the Superintendent Government Printing, Burma.

In the introduction to this Report the nature of yellow fever and its transmission, the bionomics of *S. fasciata*, how to recognise it, and the principles of its destruction are clearly set forth. The larvae were found breeding at Rangoon, Moulmein, Akyab and Bassein—in diminishing sequence. They were not found in wells, ponds, unpaved drains or creeks. Stewart notes that he has never found any in stagnant water collections of extreme foulness and that rain-water casks tarred in the interior are usually avoided. The fact that at Rangoon 286 premises were inspected, and a few breeding sites were found in nearly every house, is an index of the prevalence of this mosquito. At Bassein they were present in about 60 per cent. of 387 houses inspected. The following table gives the most frequent breeding sites noted in this survey.

Nature of breeding place.	Absolute numerical frequency.	Frequency expressed as a percentage.
1. Stale water in earthern chatties ..	675 ..	49·2
2. Stale water in barrels and casks ..	145 ..	10·5
3. Stale water in wooden tubs ..	137 ..	9·9
4. Stale water in flowerpots and vases..	117 ..	8·5
5. Stale water in { old tins, various 58 / old paint tins 25 / old kerosene tins 21 }	104 ..	7·55
6. Stale water in small gumlahs under legs of meat-safes and cupboards ..	92 ..	6·7

Thus the commonest breeding sites in mills and godowns are barrels, casks, fire buckets and earthern chatties; the commonest sites in European bungalows are water barrels and gumlahs under the legs of meat safes and cupboards; and flower-pots, vases, barrels and Pegu jars in Burmese houses. It is advised that receptacles for water should be emptied once or twice a week, or in the case of larger vessels made mosquito-proof.

A table shows the results of larvicidal experiments. The most successful larvicides were cyllin and Gorgas's larvicide with phenyle instead of carbolic acid, these in strength 1 : 1250; coal tar and turpentine emulsified in equal parts with soft soap, and a mixture of coal tar, petrol, soft soap and water; these in 1 : 2500 strength. The authors write:—

"All things considered, larvicide, composed of coal tar one pint, turpentine one pint, soft soap one ounce, made up to two gallons by the addition of water, is calculated to yield the best results.

"This larvicide after being well shaken should be added to water collections containing larvae in the proportion of one ounce (two tablespoonfuls) per gallon. Stegomyia larvae in twenty-five gallons of water can be destroyed with the larvicide in this proportion in five minutes, at an outside cost of one anna. The larvicide at current market prices costs about six annas a gallon."

Destruction of the insects by fumigation is best accomplished with sulphur dioxide gas or burning pyrethrum. The sulphur should be

burnt in a tin or other shallow vessel, placed not in water but on dry sand in a shallow open box, some two feet square in superficial area. For its insecticidal effects the gas should be kept dry. Formaldehyde gas is useless.

Appendices contain details of the streets and receptacles in which larvae were found breeding in the four towns. There are illustrations of the Stegomyia and its breeding places and five maps on which the results of the survey are charted.

A. G. B.

MISCELLANEOUS.

Granuloma Pudendi.

Wise (K. S.). **Granuloma Pudendi and its Parasite.**—*British Guiana Medical Annual for* 1912. pp. 54-64.

A description of the disease is first given. Geographically the condition has been found in British Guiana, West Africa, India, South China and Australia ; it is occasionally met with in Ceylon, Malaya and Central Africa. The attention of the medical profession of British Guiana was first drawn to it by Neal and Ozzard in 1892. Conyers and Daniels later (*British Guiana Medical Annual*, Vol. 8, 1896) gave a very good clinical description of the malady and definitely differentiated it from syphilis, malignant diseases and tubercle. As regards its etiology Wise in 1906 discovered spirochaetes in the lesions. Subsequently at intervals since that year he has examined 62 specimens of granuloma pudendi both by smears and by section. Numerous stains were used and certain curious bodies were found. The author refers to these as follows :—

" There are also present masses of small bodies which seem to represent some phase in the life history of a protozoal organism. Stained by either Leishman's or Giemsa's stain a thin capsule is apparent surrounding a clear unstained space ; in the middle of the space is a chromatin staining curved rod, thin in the middle and thicker club-shaped at each end. These bodies appear massed together in numbers varying from 2 to 25, and are often found within the leucocytic cells present."

Since that time the same or similar bodies have been seen by Donovan and Carter in India and by Cleland, Strangman and Steele in Australia. In the latter part of 1912 the author adopted the jelly intra-vitam staining method of examination and thus threw a considerable amount of light upon the nature of these protozoa-like structures.

" If a film from Granuloma Pudendi be made by this method, the cells, at first pale and colourless, gradually take up the stain (Polychrome Methylene Blue) and develop their characteristics in the course of observation. The polymorphonuclear cells, mononuclear cells, and plasma cells all appear gradually, the nuclei as a pale greenish blue and the protoplasm as a finely spotted dull red colour. Here and there are noticed small deeper bronze coloured bodies which vary in size from 2/1,000 mm. to 8/1,000 mm. Careful observation reveals in the smallest of these bodies one or two nuclear points which later become 4, 8, or 12 nuclear points ; finally, in the larger bodies 12 to 20 nuclear masses are readily detected. If watched further, the protoplasm will be seen to divide around these nuclear points and form a number of spores.

" These spores when massed in this way are very noticeable and readily seen. They are sometimes present in hundreds all over the specimens. They are very beautiful objects, in some ways resembling the rosettes of malarial parasites (the pigment of course being absent). The size of each spore is about 2/1,000 mm., they are bronze coloured, slightly pear-shaped, being pointed towards the centre of the rosette and arranged regularly around the centre. Probably the real position of these sporulating bodies is within mononuclear cells, but in the scraping during preparation for observation, many of the sporulating bodies are forced outside the cells and broken, so that scattered fours, eights and twelves of these spores may be found extra-cellularly situated. It is easy to find six or seven of these sporulating rosettes in a single bloated, tensely-filled mononuclear cell. The further stages of existence as noted under the microscope show that

the spores remain in the rosette formation, but finally the cell bursts, or some surrounding invisible envelope bursts, and the spores are shot out into the surrounding plasma."

From these observations then it would appear that the protozoa-like bodies seen in dried stained films are really dead distorted remains of a rosette-like protozoal sporulation, the bodies seen in stained smears being really distorted spores of the asexual cycle of a protozoal parasite. The author does not explain the nature and exact zoological position of the parasite but hopes to do so at some later date.

G. C. Low.

Aragao (Henrique de Beaurepaire) & Vianna (Gaspar). **Untersuchungen ueber das Granuloma venereum.** *Memorias do Instituto Oswaldo Cruz.* 1913. Vol. 5. No. 2. pp. 211-238. With 7 plates.

A somewhat lengthy account of the subject of Granuloma pudendi. The disease appears to be common in Brazil and clinical material was easily obtained. Wassermann's reaction was negative, this confirming the well-known view of the non-syphilitic nature of the disease. The work of Wise and other authorities on the spirochaetes and protozoa-like bodies that have been found in the lesions is mentioned in detail. According to the authors Flu has cultivated a germ from granuloma, but their researches do not confirm this work. In three out of eight of their cases they also isolated an organism but not the same as that described by Flu. Their bacterium is a facultative aerobe and grows best at 37°C. It produces fermentation but neither indol nor sulphuretted hydrogen. Acid production takes place in the cultures in the first days, then diminishes, and finally remains constant. The organism lives well on artificial media even up to the end of six months.

[Wise's paper above clearly shows that the organism is a protozoon, not a bacterium. It looks therefore as if the authors had only cultivated some secondary contaminator.]

For treatment the authors advise intravenous injections of tartar emetic. In one case 21 of these injections were given as follows :— 1st day 0·05 gm., 2nd 0·08 gm., 3rd to 13th 0·1 gm., 14th to 17th 0·08 gm., 18th to 21st 0·1 gm. or a total of about 1·8 grammes.

In another case, a woman, ten injections were given within a period of thirty days. Rapid healing of the lesions took place in both these as in other cases, the results being permanent.

[If suitably confirmed this is a great advance in the therapy of this disease. Up to the present the condition has stubbornly resisted all medical treatment, the only chance of preventing its spread being to detect it early and to excise it completely by surgical methods.]

G. C. L.

Terra (F.) & Rabello (Ed.). **Le Granulome ulcéreux et sa Cure.**— *Bol. Soc. Brasileira de Dermatologia.* 1913. Vol. 2. No. 1. pp. 3-12.

The authors describe the condition as consisting of a chronic disease characterised by ulcerative, vegetative or granulomatous lesions, with dense cicatrisations and localised to the organs of generation. The work accomplished in British Guiana by various workers is referred to [see paper above by Wise]. They found, as others, that the disease is

not syphilitic, Wassermann's reaction being negative and anti-syphilitic treatment of no use. The protozoal organisms described by Wise and others are also discussed. From two cases observed by the authors a sporotrichum resembling the sporotrichum of Schenk was found and this led them to the belief that the disease might be a species of sporotrichosis.

For treatment the method of Aragao and Vianna [see above] was adopted. This consisted of intravenous injections of a solution of tartar emetic, dissolved in physiological serum, which were given, one every day at first and then one on alternate days; after a few injections the ulcers began to show signs of healing and, according to the authors, completely disappeared after the fifteenth injection. They believe therefore that tartar emetic is a specific for this disease.

G. C. L.

Climatic Bubo.

Chastang (L.). **Quelques Remarques au Sujet de la Nature et de l'Origine du Bubon Climatérique.**—*Caducée.* 1914. May 2. Vol. 14. No. 9. pp. 118-119.

The author mentions some of the different hypotheses which have from time to time been brought forward to explain the nature of the disease. Legry and Nattan-Larrier, for example, believe that the condition may be a sporotrichosis. Rost's view [see this *Bulletin* Vol. 1, p. 474] is also given; the fact that the disease is not found in children nor in continent adults certainly strengthens his idea of its venereal nature. The author, from considerable experience of the disease, confirms the fact that the condition is only met with in the male sex and quotes Grey's figures for Pekin, where out of 37 observations, the disease always occurred in men. The author pertinently points out that if one admits a venereal etiology for the complaint females should suffer as well as males. As a possible cause he suggests that intertrigo, which is common in men who have to make fatiguing marches, may have something to do with the etiology.

G. C. L.

Barlow (N.). **Epidemic Climatic Bubo.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1914. May. Vol. 1. No. 11. pp. 787-788.

Apparently carried by some biting insect an epidemic form of climatic bubo has recently occurred in certain localities near Cuyamel, Honduras. The disease sets in rather sharply with pains in the limbs and back, headache, anorexia, rarely nausea and vomiting, irregular fever and painful swelling in and around a single gland with redness of the superadjacent skin.

In no instance was more than one gland involved and except in cases of secondary infection suppuration was not noticed. The condition is usually met with in one of the inguinal or axillary glands, but any gland of the body may be affected.

According to the author salicylates in large amounts, 40 grains or more daily, are specific. If treatment is begun early on the first or second day the patient may be at work again in three days. Counter irritation should not be employed.

G. C. L.

Rat Bite Disease.

Schottmüller (H.). **Zur Aetiologie und Klinik der Bisskrankheit. (Ratten-Katzen-Eichhörnchen-Bisskrankheit).** [The Etiology and Clinical Aspects of Diseases due to Bites (Rat. Cat and Squirrel-Bite Diseases).] *Dermatol. Wochenschr.* 1914. Ergänzungsheft zu Band 58 (Festschrift). pp. 77-103. With 4 figs. and 2 curves in text, and 2 coloured plates.

Reference is first made to the fact that the bites of other animals in addition to rats (cats, weasels and squirrels) may give rise to the disease. Miyake's work is then detailed as is also Ogata's discovery of a supposed protozoon in the blood. [For this see this *Bulletin* Vol. 1, pp. 407–409.]

Pröscher, it is stated, has not confirmed the latter observation. The author then describes in detail two cases of the disease—one that of a laboratory attendant bitten on the thumb by a rat, the other that of a woman bitten on the forefinger and thumb of the right hand by an African squirrel (*Taraxerus cepapi*). Amongst the clinical symptoms which developed in this case were little nodules in one eye, these finally extending and completely destroying the sight of that organ. Since then the latter animal, which is now confined in Hagenbeck's Zoological Gardens, has bitten another man, but so far nothing has happened.

In smears of pus made from the lesions of the second case the author found numerous rod-shaped structures about the length of a tubercle bacillus. These on being cultivated took the appearance of a streptothrix, long thread-like forms developing. He proposes to name this organism the *Streptothrix taraxeri cepapi*. Some experimental inoculations were made on monkeys with positive results, one, for example, developing similar eye lesions (panophthalmitis) to the woman, but nothing happened in rabbits and guinea-pigs. Microphotographs of the streptothrix are given and two coloured plates show the skin and eye lesions in the human subject very well.

G. C. L.

Dalal (A. K.) **Case of Rat-Bite Fever, treated with Intravenous Injection of Neo-Salvarsan.**—*Practitioner.* 1914. Mar. Vol. 92. No. 3. (No. 549). p. 449.

The history of the case was as follows :—The patient was bitten on the inner side of her right ankle by a rat eighteen days before being seen. There was some slight haemorrhage at the time but on the fifth day the wound had healed, leaving a small white scar. On the tenth day there was some swelling round the scar. On examination the author found that in addition to the swelling there was pain along the lymphatics with enlargement of the popliteal and femoral glands. Weight could not be borne on the leg nor could the patient fully extend the knee and hip joints. ·9 grm. of neosalvarsan was injected intravenously. After a week the enlargement of the glands and the pain along the lymphatics, as well as the fever, disappeared completely. A month later the patient was seen again and during that time there had been no recurrence of the disease.

It is stated that rat bite disease, though rare in Europe, is common in India.

G. C. L.

Lagriffe & Loup. **Un Cas de Sokodu.**—*Presse Méd.* 1914. Apr. 18. No. 31. pp. 456-458.

A case of rat bite disease is described, the patient, a woman, having been bitten on the finger by a rat. Some time after an eruption appeared on the face and body, this being followed by the usual signs of the disease. The authors state that though their observations were incomplete their case presented features of interest. The cases reported by Horder and Frugoni are referred to [see this *Bulletin* Vol. 1, p. 409] and Ogata and Shikami's work is also mentioned.

G. C. L.

Entomological Papers.

Doane (R. W.). **Disease-Bearing Insects in Samoa.**—*Bull. Entomol. Research.* 1914. Feb. Vol. 4. Pt. 4. pp. 265-269. With 3 plates.

The author stayed for a short time during the summer of 1913 on the island of Upolu, German Samoa, and made a few observations on mosquitoes and flies. *S. fasciata*, *S. pseudoscutellaris* and *Culex fatigans* are all numerous. *S. fasciata* is troublesome in the house all day. Most relief can be had by capturing them with an insect net. All the cisterns were screened and tin cans and broken bottles round the house were emptied, but these mosquitoes still abounded. He found that they were breeding in the roof gutter over his window and in the concave bases of upturned bottles, which bordered a walk and were overgrown by vegetation. Larvae were numerous also in the hollow of an old bread fruit tree which branched close to the ground. He points out the danger of the introduction of yellow fever when the Panama Canal is opened.

When twilight comes *S. fasciata* retires and *Culex fatigans* appears. Physicians in these islands believe that more than 50 per cent. of the Samoans become infected with *Filaria bancrofti* by being bitten by this mosquito. It transmits also the organism of dengue fever, frequent among the Samoans. *C. fatigans* breeds with *S. fasciata* near dwellings, and also much farther away with *S. pseudoscutellaris*.

S. pseudoscutellaris is very common about the house and bites during the day. It is often found breeding in the cup formed when a papay tree is cut down; it is not definitely known to transmit any disease. Another mosquito found in Samoa is *Finlaya kochi* Dönitz. Bites which caused much irritation and also small sores were believed to be due to this mosquito.

Musca domestica occurs in extraordinary numbers in Samoa. It is suggested that flies convey typhoid and yaws. Another dreaded disease carried by flies is Samoan conjunctivitis. Flies swarm round the eyes of children suffering from this disease. Blindness of one or both eyes is commonly caused by it.

The examination of a single rat caught in a store resulted in the capture of a number of *Xenopsylla cheopis*, the Indian plague flea. The dogs were badly infested with *Rhipicephalus sanguineus*, which transmits malignant jaundice in South Africa and India.

The author points out that on some of the Samoan islands these insect pests can be controlled with a reasonable amount of intelligently directed effort.

A. G. B.

Echeverria (Emilio). **Innocuous Bites of Malaria and Yellow Fever Mosquitoes during the Daytime.** –*Amer. Jl. Trop. Dis. & Prevent. Med.* 1914. Mar. Vo. 1. No. 9. pp. 625-626.

The author refers to Central and South American experience that persons who work in malaria and yellow fever districts may avoid these diseases by spending the nights on higher ground. He asks how it is that a non-immune person may be bitten with impunity by yellow fever carriers, even in a well-marked epidemic of the disease, as long as this happens in the day time. The explanation he offers is that the female mosquito bites as soon as possible after emergence from the pupa, when she is of necessity harmless, but that afterwards she takes to the nocturnal habits which are natural to her. The prophylaxis of these diseases is therefore comprised in the words "avoid being bitten by a night mosquito."

A. G. B.

Macfie (J. W. Scott). **A Note on the Action of Common Salt on the Larvae of** *Stegomyia fasciata.*—*Bull. Entomol. Research.* 1914. Feb. Vol. 4. Pt. 4. pp. 339-344. With 1 plate.

Graham found that the suspended matter in water in which the larvae of *Pyretophorus costalis* were breeding could be precipitated by the addition of 3 per cent. of common salt and that then the larvae fed on one another. He considered that this phenomenon was due to the larvae being deprived of their natural food, the algae, which had been destroyed by the addition of salt. The author's experiments were undertaken to determine to what extent the action of the salt on mosquito larvae was due to the destruction of the natural food supply and to what extent to the hypertonic nature of the solution. The larvae were those of *S. fasciata.* Samples of water were obtained from the water-pots and domestic utensils in the native quarters at Lagos and an analysis was made of the amount of salt present. The average of six determinations was 0·012 per cent. NaCl. This percentage is therefore assumed to be that in which the larvae thrive best. Experiments were then made with solutions of 0·5 per cent. of NaCl and upwards and then with more dilute solutions.

"The experiments would seem to prove that, in solutions of 2 per cent. and upwards, the action of common salt on the larvae of *Stegomyia fasciata* is due to the hypertonicity of the solution. In more dilute solutions the destruction of the natural food supply of the larvae may have some influence. Alum, however, which clarifies water more efficiently than common salt, has no peculiar action on the larvae.

"In Lagos the larvae of *Stegomyia fasciata* are found most abundantly in water contained in domestic utensils, and in the large pots in which the natives store up water for drinking and cooking. It would be of great advantage if common salt could be used as a larvicide in these cases. . . . From the experiments described, it would appear that sufficient salt would have to be added to each vessel to bring the concentration of the solution up to 2 per cent. NaCl in order to ensure the destruction of the larvae."

Some experiments were done to determine to what extent mosquito larvae were capable of surviving in temporary pools, such as those beneath the taps of tanks and the open ends of drains into which

larvae are apt to be swept. These were not very conclusive. The author thinks it would be a wise precaution to treat these places with larvicides.

A. G. B.

Simpson (J. J.). **Entomological Research in British West Africa. V. Gold Coast.**—*Bull. Entomol. Research.* 1914. Apr. Vol. 5. Pt. 1. pp. 1-36. With 4 plates and a map.

This is the last of a series of papers dealing with entomological research in the British Possessions in West Africa. The author points out that this report must be taken in conjunction with the previous four. His observations were made during a tour in the Gold Coast from November 1912 to June 1913. An account is given of the geography of the Gold Coast. The Volta is by far the most important river and connects the French Sudan, the French Ivory Coast, Togoland, the Northern Territories and Ashanti with the Gold Coast Colony. The vegetation and the climate and rainfall are dealt with, with meteorological tables. It is stated that the Gold Coast is the colony of least rainfall in West Africa.

Sixteen pages are occupied by the narrative of the author's journeys, which contains much information of local value. At the capital, Accra, both *G. palpalis* and *G. longipalpis* have been captured within the last few years. The author says that both are introduced from the surrounding country by trains and motor wagons from distances five to twelve miles from Accra. At Yeji, one of the largest ferries on the Volta River, *G. morsitans*, *G. palpalis* and *G. tachinoides* were found. In 1912 over 50,000 natives crossed at this point and 23,000 animals. Simpson points out that the ferry is a good source of revenue and part might with advantage be devoted to clearing the banks of the river. At Kintampo, in Ashanti, he states that recent extensive clearing has caused an enormous reduction in the numbers of tsetse flies, five species of which occur. In a journey from Seccondi to Accra by way of the coast the author found that the predominant tsetse fly was *G. longipalpis*, *G. palpalis* being found at mouths of rivers. Mosquitoes, including *S. fasciata*, were extremely troublesome, breeding in casks, old canoes and other receptacles used for tanning nets.

A list is given of the blood-sucking insects and other arthropods recorded from the Gold Coast. Notes are given on malaria, yellow fever, sleeping sickness, plague, trypanosomiasis of stock, and spirochaetosis. It is noted that *Stegomyia fasciata* is most common along the coast. Of the cattle brought from the north and slaughtered in Coomassie about 80 per cent. harboured trypanosomes. Notes are given on the distribution of the ten species of Glossina found in the Gold Coast. The Colony is compared with Southern Nigeria, the Northern Territories with the northern part of Northern Nigeria. There are four species of the *palpalis* group, *G. palpalis* itself being closely associated with all the river systems; *G. tachinoides* is the predominant species in the Northern Territories. There are two species of the *morsitans* group, *G. longipalpis* being found in the denser part of the savannah forest, *G. morsitans* in the more open and drier country. There are three species of the *fusca* group, and one of the *brevipalpis* group. The author is strongly inclined to think that there

is a closer connection between the prevalence of game and *G. morsitans* than of any other species. A list is given of the parasites of game and other animals found.

Photographs show the character of the vegetation and a map the distribution of sleeping sickness and tsetse flies and the various types of vegetation. The records of tsetse flies correspond for the most part with the author's routes. A. G. B.

Schüffner (W.) & Swellengrebel (N. H.). **Stegomyien van Deli.** [The Stegomyias of Deli.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1914. Vol. 54. Pt. 2. pp. 204-205. With 1 plate.

A note on the species of Stegomyia met with at Deli, Sumatra. *S. fasciata* was first observed and described in 1908 by Mr. and Mrs. van Loghem-Pauw, and since then *S. scutellaris* and *S. pipersalata* have also been recognised. The two latter do not seem to be capable of conveying yellow fever. An illustration is given of the distinguishing points of the three species. *S. pipersalata* has only been found once, whilst *fasciata* seems to be less common than it was a few years back. *Scutellaris*, on the other hand, is becoming the common house-mosquito in many parts of the district. J. B. Nias.

Book Review.

Regarding the review of our book* on p. 52 of Vol. 4 of this *Bulletin*, issued on June 30, 1914, there are certain statements therein, which, as they tend to misrepresentation, need to be pointed out. The book deals, as our reviewer acknowledges, with the life histories of certain parasitic Protozoa. Colonel Alcock, our reviewer, is well known for his work on Indian marine biology and more recently as a worker on entomology, but surely in these days of specialisation he can hardly expect also to be regarded as a protozoologist. Naturally, then, in the review, there is little stated as to the merits of the book as a work dealing with protozoology.

The notice of the book has been made detractory by the unfortunate use of the method of partial quotation, certain excerpts being given apart from their context and depreciatory inferences drawn or suggested therefrom.

To take the partial quotations and certain other lapses and give them shortly in their actual setting as they appear in the book itself :—

What the Reviewer writes :	*What occurs in the book :*
(*a*) 'The tsetse fly is represented as "dropping maggots which rapidly become very like the foetid surroundings in which they live."'	(*a*) p. 23. "Lurking under rotting leaves, among banana roots, and in the soft shaded soil near the streams, the parent tsetse flies drop small maggots, or larvae, which rapidly become very like the foetid surroundings in which they live."
[The quotation is not strictly accurate.]	p. 31. "The tsetse fly does not lay eggs, but within her body a yellowish footless maggot develops. When this is passed from the body of the parent it creeps into the soil and becomes dark in colour."

* Fantham (H.B.) [D.Sc.Lond., B.A.Cantab.] & Porter (Annie) [D.Sc.Lond.] Some Minute Animal Parasites or Unseen Foes in the Animal World.—1914. London: Methuen & Co., Ltd. [Price 5/- net.]

(*b*) 'The spread of Glossina from Africa to India in "certain kinds of vegetable cargo."	(*b*) p. 36. "The Indian authorities exercise great care in preventing infected persons from landing and in scrutinising certain kinds of vegetable cargo for possible pupae of *Glossina palpalis*."
(*c*) 'The development of Southern India (of all places on this dull terrestrial ball) is represented as having been retarded by the destructive effects of Protozoa upon transport animals.'	(*c*) p. 45. "In South India railway development has been retarded to a great extent by the difficulty of transport of materials. Horses and other baggage animals are victims of a trypanosomiasis for which the native name is 'surra.'"

This is an example of a bad lapse by the reviewer from the original statement, which concerns railway development and specifically mentions "surra." Colonel Alcock's opinions on Southern India apparently do not agree with those of the Government, which, according to the press, has just floated a loan for such railway development.

(*d*) 'The airy vision [*sic*] that sees Protozoa at the bottom of all [*sic*] the extinction revealed by the geological record is mentioned with respect and half approval.'	(*d*) p. 300. "One recent suggestion is that the disappearance of these mammoth creatures from the earth's surface was due to the activity of malarial parasites, trypanosomes, or other parasitic Protozoa."

In this connection we need only mention the works of Sir Ray Lankester and Mr. W. H. S. Jones.

(*e*) 'The spirochaetes are given substantive rank in the Animal Kingdom.' [This is not stated in the book at all.]	(*e*) The Spirochaetes are discussed in Chapter IV, entitled "The Spirochaetes: Border-line organisms between plants and animals." p. 87. "We think that the balance of evidence is somewhat in favour of the inclusion of the spirochaetes among the protozoa and of the adoption of the new class, Spirochaetacea, which was first set forth in 1907."
(*f*) 'The unknown virus of yellow fever is dealt with in the body of the book, instead of in an appendix.'	(*f*) p. 165. "Dr. Seidelin, working at Merida in Yucatan four years ago, found certain bodies in the blood of yellow fever patients. He believes these to be Protozoa responsible for the disease. Other workers have not found these bodies in yellow fever patients on the one hand, or on the other they have found similar bodies in cases of other complaints. More work is necessary before the exact nature of the agent of disease is determined, and some is now in progress in Africa."

In addition to the foregoing, there are also inaccuracies and deficiencies in the statements regarding the contents of the chapters, e.g., "Grouse-disease," "Bee- and Silkworm-diseases." Grouse, bees and silkworms alike suffer from more than one disease. Those discussed in the book are coccidiosis and microsporidiosis, terms quite familiar to the public inter-

ested in poultry-keeping and game-preserving, and in bee-keeping respectively. Herpetomonas, Crithidia and Rhinosporidium among others are also described in the book, but mention of them in the review is omitted.

Lastly, with regard to the alleged dramatic method, apparently so repugnant to the reviewer, we leave the accuracy of his statements in the hands of the reader. As in the opinion of our critic "the mode of treatment" in the book "is eminently practical" and at the same time "undoubtedly is suggestive and stimulating," we hope that it may still be of service to those for whose information it was written.

H. B. Fantham.
A. Porter.

I do not consider that the review is either detractive in its general tone or unfair in any specific line of argument.

To reply to the objections in their order :—

(*a*) The gravamen of the criticism lies in the powerful and misleading adjective "foetid," which is not modified by the subsequent statement on p. 31.

(*b*) I regret that I did not state explicitly that the allusion is to the *pupae* of *Glossina palpalis*. The allusion to *Glossina* was, naturally enough, detached from its context (namely the allusion to infected persons), because until it has been proved conclusively that the trypanosomes in question cannot be transmitted by *other* biting insects besides *Glossina*, the surveillance of infected persons is a preventive measure that is quite above criticism. I still consider that the scrutiny of any kind of vegetable cargo imported into India from Africa in the expectation of finding living pupae of any species of *Glossina* therein is, for several reasons, a proceeding that is not entitled to very respectful consideration.

(*c*) Though I might, perhaps, have made it clear that the authors referred particularly to railway development and to surra, I cannot concede that the argument is affected by the omissions. Quite apart from the interdependence of the two lines of development, it can be affirmed (1) that surra is no more embarrassing to South India than it is to other parts of the Indian Empire ; and (2) that financial and strategic considerations having, up to quite recent years, been the main determining factors, Southern India has lagged in the matter of railway construction because it is that part of the Indian dominions that is most remote from the historically-vulnerable frontiers.

(*d*) I admit that I have indulged in hyperbole in my reference to a speculation which—however much its specific applications be limited—lies outside the boundaries of exact knowledge : but I think that my words make it clear that I did not attribute this speculation to the authors.

(*e & f*) The essence of my argument is that in the main substance and fabric of a book expressly limited in its title to animal parasites and the animal world, certain things whose exact position in the Cosmos is debated are incorporated. I approached the subject—and I still regard it—as a question of unity and a matter of taste.

A. Alcock.

Colonel Alcock naturally does not deal with the question of his competency to review a work dealing with the life history of parasitic Protozoa, raised in the first paragraph of the authors' statement. To this it may be replied that Colonel Alcock was for thirteen years Professor of Zoology in the Medical College of Bengal, and that the sub-title of the book would seem to indicate that it is not intended only for specialists, as indeed may be gathered from the preface.

Editor.

LIST OF REFERENCES.

Compiled by R. L. Sheppard, Librarian of the Bureau.

[Continued from Bulletin, Vol. 3, pp. xxxi-xxxii.]

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AMOEBIASIS (including Entamoebic Dysentery and Liver Abscess.)

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